THE IRON AGE

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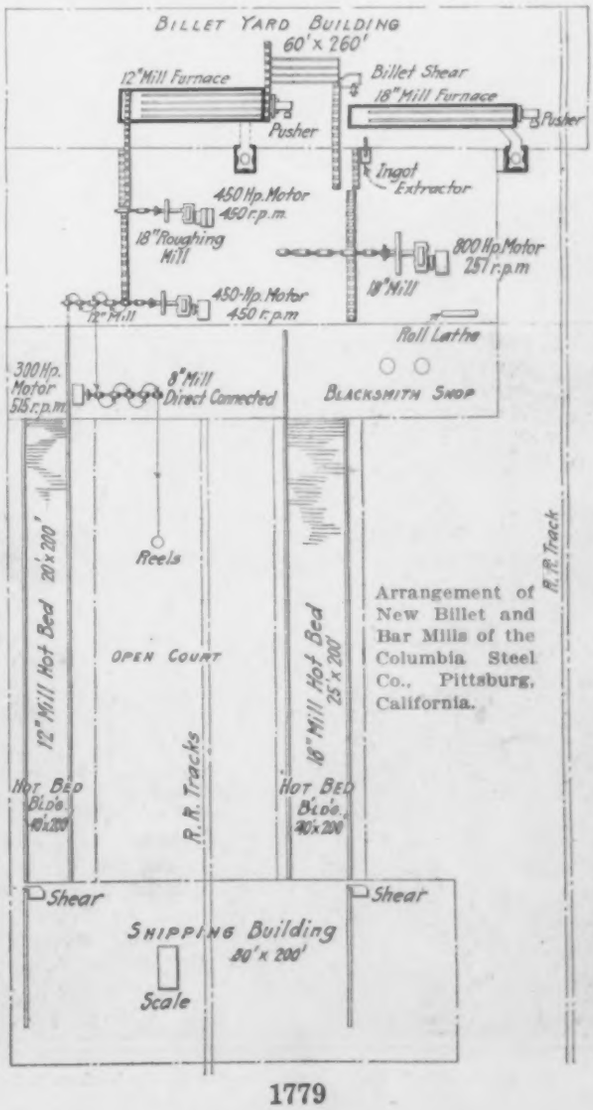
A Modern Bar Mill at Pittsburg, California

Motor-Driven 18-Inch and 12-Inch Stands for the Production of Bars and Small Shapes, in Part for the Export Trade

THE Columbia Steel Co., whose steel foundry at Pittsburg, Cal., 50 miles northeast of San Francisco, has been so important in Pacific coast industry, recently completed a modern rolling mill adjoining the steel foundry. The products of this mill consist of square deformed bars for reinforcing, from ⅜ in. to 1¼ in., plain square and round bars, from ½ in. to 1½ in., and rivet rods, ⅝ in. and larger. The steel foundry was described in THE IRON AGE of Jan. 23, 1919, by J. D. Fenstermacher, the company's general sales manager. It was erected under the supervision of the late S. T. Wellman, of Cleveland, assisted by D. H. Botchford, the company's general manager, and had originally a 20-ton basic open-hearth furnace. A 10-ton acid open-hearth furnace was added and later a 30-ton basic furnace, making the present capacity of the open-hearth department about 7000 tons per month. Important additions were made to the steel foundry in the period of the war and it was under intensive operation in all that period, supplying castings to Pacific coast shipyards in addition to its regular products, which are principally railroad and sugar mill castings.

The open-hearth department supplies the new rolling mill with 8-in. ingots cast in groups of 24 and bottom poured. The newly completed plant consists of an 18-in. merchant mill. an 18-in. roughing mill and a 12-in. finishing mill, which were furnished by the United Engineering & Foundry Co., Pittsburgh. The arrangement of these mills together with the heating furnaces, power equipment, cooling beds, etc., is shown in the accompanying plan view, which includes also an 8-in. mill. This latter is now building and will be started late in the year. It will roll small sizes and these will be reeled. On March 29, 1920, the first product was rolled at the new plant. The 18-in. merchant bar mill is used to break down the 8 x 8-in. ingots into billets which are finished into bars by the 12-in. Belgian mill. The latter started operations on April 5. Eventually large rounds, squares and light shapes will be finished on the 18-in. mill direct from the ingot. The three mills are motor-driven, there being in the case of a Pacific Coast rolling mill, in addition to the usual advantages of electric drive, that of low-priced current.



Arrangement of New Billet and Bar Mills of the Columbia Steel Co., Pittsburg, California.

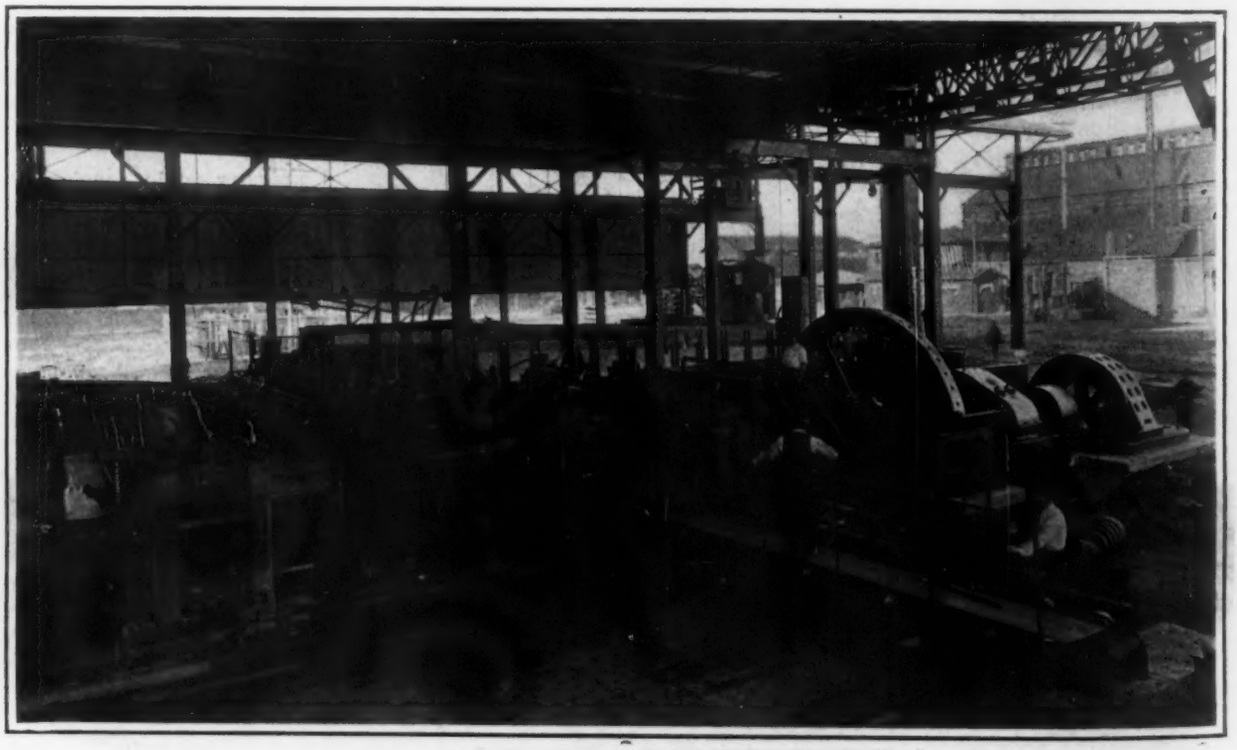
Coming from the open-hearth department the ingots are charged into a continuous heating furnace, end oil-fired, and of the pusher type, 91 ft. long, 6 ft. 6 in. wide, with a capacity of 104 ingots. An ingot extractor, designed and built by the company and operated by compressed air, travels back and forth on a track between the discharge end of the furnace and a conveyor leading to the tilting table serving the 18-in. mill. It is equipped with tongs which open and close and raise and lower. A table revolves on the car, since it is necessary to turn every other ingot as it comes from the furnace so as to get the small end of each into the blooming rolls first, effecting a considerable saving in time. Thus also the ingots go to the shear in proper order for cropping. The extractor, which is operated by a boy, has an ordinary 3-way air cock control, acting quickly and efficiently.

The 18-in. mill has

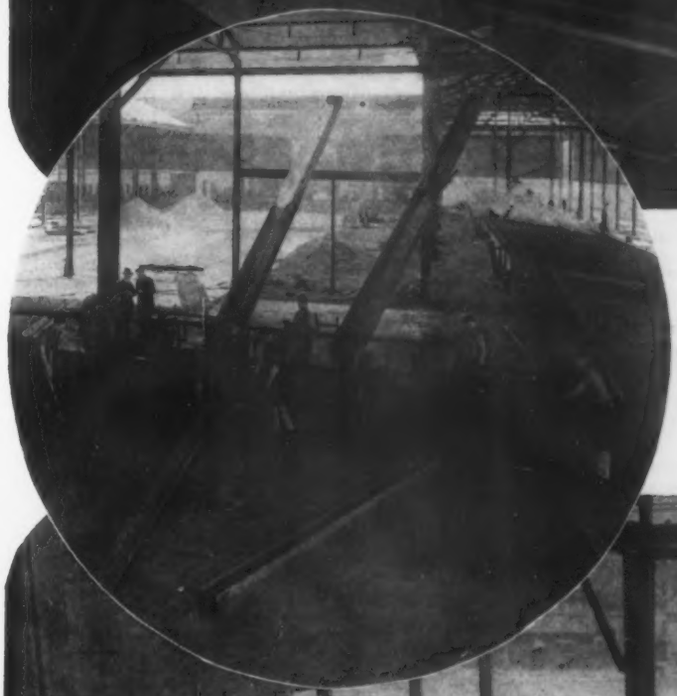
Mill Building, with 800-hp. Motor Drive for 18-In. Mill in Foreground

four stands, three of which are three-high and the other two-high. It is driven by an 800 hp. heavy duty, slip ring type rolling mill motor with a speed of 257 r.p.m. With reduction gear 3 to 1 the mill speed is 85 r.p.m. The flywheel is 16 ft. in diameter and weighs 20 tons. The mill is equipped with outboard bearings and inclosed pinions. At present two mechanical tilting tables, one on each side, handle the piece in rolling. Another set of tables will be provided later.

The plan view shows the provision made for billet storage and for the transfer of billets to an end oil-fired, continuous furnace which is 45 ft. long and 13 ft. wide. This, like the furnace of the 18-in. mill, is equipped with skid pipes circulating water. A conveyor delivers billets from the furnace directly to the 18-in. roughing mill. A downside roughing table is now being installed, also a bar conveyor for handling bars from the roughing mill to the 12-in. finishing mill. This last, which is a Belgian mill, has five stands, four of which are three-high and one two-high. .The roughing mill and finishing mill are each driven independently by a 450 h.p. motor with a speed of 450 r.p.m. The roughing mill speed is 100 r.p.m., reduction gear being 4½ to 1. The fly wheel is 12



18-In. Merchant Mill. Ingot furnace in the background



(Above) Conveyor Delivering Billets from Furnace Directly into 18-in. Roughing Mill. (Inset) 12-Inch Finishing Mill, with Inclined Run-outs. Cooling beds at right. (Below) Ingot Extractor and Billet Bar Conveyor to Shear

ft. in diameter and weighs 14 tons. In the case of the 12-in. mill the speed is 185 r.p.m., reduction gear being 2½ to 1. The fly wheel is 10 ft. in diameter and weighs 10 tons. Both the mills have inclosed pinions. The mill motors are alternating current and the table and conveyor motors direct current. All motors, transformers and switchboards were furnished by the General Electric Co.; the reduction gear sets were furnished by the Falk Co., Milwaukee, and the flywheels were cast and machined by the Joshua Hendy Iron Works, San Francisco. The tables, conveyors and shears were designed and built by the Columbia Steel Co.

The cooling bed for the 12-in. mill is 20 ft. wide and 200 ft. long with top and bottom conveyors. The bars are delivered by bottom conveyors to finishing shears in the end of the storage building. Similar hot bed equipment will be supplied for the 18-in. merchant mill.

Ground was broken for the building foundations on Aug. 8, 1919. Due to the coal, steel and railroad strikes, the work was set back from time to time but in spite of these obstacles excellent progress was made later, as is indicated by the starting of the mills before the end of March. The buildings, which are of structural steel, fabricated and erected by Dyer Brothers, San Francisco, are of the V roof type, and are covered with galvanized, corrugated iron. All are light and airy, with high roofs, the minimum crane clearance being 28 ft. The billet building is 60 x 260 ft., and the mill building 60 x 240 ft., with a lean-to 40 x 200 ft. The hot bed buildings are each 40 x 200 ft. and the shipping and storage building 80 x 200 ft. Two 5-ton overhead traveling cranes are provided for the billet building, a 10-ton traveling crane for the mill building and a 10-ton crane for the shipping and storage building. These were furnished by the Cyclops Iron Works, San Francisco. The crane motors are alternating current.

A feature of the plant which the visitor will not overlook is the precaution taken to insure safety. All gearing is solidly inclosed and motors, transformers and flywheels are surrounded by heavy wire screening. Steps and platforms are built to permit ready passage from one side of the mill to the other. A further feature is that the layout permits the travel of steel in practically a straight line from the ingot to the finished bar in the storage warehouse. This is no small factor in securing economical production. There was no interruption in the early period of operation, as is commonly the case, the first month showing an average output of about 100 tons per 8-hr. turn. Operation is now on a two-shift basis.

The product of the new mill is sold both in the export and the domestic trade. Material for export is shipped direct by lighters from the company's docks, which are located on the New York slough of the San Joaquin River. Both the San Joaquin and the Sacramento rivers empty into Suisun Bay, a short distance from the plant. Shipments from the docks are delivered alongside steamers in San Francisco Bay. Two transcontinental railroads, the Santa Fe and the Southern Pacific, connect with the plant and the San Francisco & Sacramento Electric Railway line gives added facilities.

Decline in British Non-Ferrous Metals

The following comparison of British metal prices per gross ton at the end of February and on May 19 is given by the London *Iron and Coal Trades Review* to show clearly the enormous depreciation of values, unprecedented in so short a space of time, that has taken place:

	End February.			May 19.		
Copper	£121	0	0	£87	10	0
Tin	418	0	0	283	0	0
Spelter	61	0	0	44	15	0
Lead	51	0	0	37	5	0

Such movements cannot occur without causing serious loss in the trades and industries using and dealing in these metals.

If they were confined to metals, the reasons for them might be of little general importance, but similar and even worse demoralization dominates practically every market in the country, and the root causes are not far to seek and can be stated quite briefly as follows:

Over-speculation.

The mere discussion of a levy on capital increment since 1914, however gained, has produced a widespread feeling of alarm that, if it gets beyond discussion, the financial fabric of this country will stagger.

Acting on the instigation of the Chancellor of the Exchequer, the banks all over the country are stated to have withdrawn certain facilities to their customers, and apprehension, probably unjustified, has been occasioned.

The British Ferroalloy Market

Conditions in the British ferroalloy market are thus outlined by a recent issue of the London *Iron and Coal Trades Review:*

Ferrovanadium is still in demand for a large tonnage, both for home and continental destinations, but there is little or no material to be obtained in this country, and there is also little in transit.

Ferrochrome is slowly coming back to its own again, and increasing quantities are being inquired for in all grades. Low carbon grades have not yet advanced, but the improved rate of exchange between this country and France has adversely affected French material, and the British makers hold the market. High-carbon grades maintain their recent advance, and are expected to improve further.

Ferrotungsten supplies are easy, and the price of 3s. 3d. per lb. is maintained. Tungsten-powder can be obtained with fairly prompt delivery at 3s. 9d. per lb.

Twelve per cent ferrosilicon, blast-furnace grade, is offered at about £17 per ton makers' works. Twenty-five per cent ferrosilicon, electric-furnace manufacture, is about £20 per ton, while 45 per cent and 75 per cent grades remain firm at about £25 and £37 10s. per ton respectively. Stock deliveries can be given in all cases.

The following are current prices of ferroalloys and metals for steel making. Prices are net, delivered Sheffield steel works:

Ferrotungsten (low carbon).—80 to 85 per cent, 3s. 3d. per lb.

Tungsten metal powder.—98 to 99 per cent, 3s. 9d. per lb.

Ferrochrome (5-ton lots).—4 to 6 per cent carbon, £46 ton, scale 15s. unit; 6 to 8 per cent carbon, £44 ton, scale 15s. unit; 8 to 10 per cent carbon, £42 ton, scale 15s. unit; all 60 per cent basis.

Ferrochrome (specially refined), broken in small pieces for crucible steel work; quantities of 1 ton or over.—Max. 2 per cent carbon guaranteed, £97 10s. ton, scale 34s. unit; max. 1 per cent carbon guaranteed, £112 ton, scale 39s. unit; max. 0.75 per cent carbon guaranteed, £128 ton, scale 47s. unit; all 60 per cent basis.

Ferromanganese.—76 to 78 per cent loose, £37 ton; export, £45 ton; packed, £1 per ton extra.

Ferrosilicon.—40 to 50 per cent, £25 ton, basis 45 per cent, scale 8s. unit; ditto, 75 per cent, £37 10s. ton, basis 75 per cent, scale 12s. 6d. unit.

Ferrovanadium.—35 to 40 per cent Va., 60s. lb. of Va. contained in alloy.

Ferromolybdenum.—70 to 80 per cent Mo., 11s. lb. of Mo. contained in alloy.

Ferrotitanium.—23 to 25 per cent Ti., carbon free, 1s. 10d. lb., flat price.

Ferro-carbon-titanium.—15 to 18 per cent Ti., 8½d. lb., ton lots, flat price.

The strike in foundries at York, Pa., is not proving very troublesome. THE IRON AGE is advised that none of the foundries was shut down entirely, and all are working with production very little reduced. A few pickets are out and one strike fence has been erected, but there has been no serious trouble.

Use of Nut Coke in the Blast Furnace

Result of an Interesting Experiment Reported at Southern Ohio Pig Iron and Coke Association—Serious Car Shortage Discussed at Ironton Meeting

AT the regular bi-monthly meeting of the Southern Ohio Pig Iron and Coke Association, attended by representatives of blast furnaces and coke producers operating in the Ashland, Ky., Ironton, Portsmouth, Hanging Rock, Jackson-Wellston, Hamilton and Columbus districts, a very interesting paper was read by J. B. Rogers, superintendent of the Norton Iron Works, Ashland, Ky., on "The Use of Nut Coke in the Blast Furnace." Mr. Rogers' paper, covering, as it does, the operation of the furnace for a long period, will prove very instructive to operators everywhere, and for this reason the paper is reproduced in full here.

A very interesting discussion followed the reading of the paper, and much valuable information gleaned from the experiences of other operators with nut coke. It developed that some furnaces are now using coke that passes over a ¾-in. screen. One operator reported that he did not get as much breeze as from regular furnace coke, and did not make as much flue dust. The practice of putting coke breeze into furnaces will always give trouble, according to the experiences of several operators, while it was the opinion of coke operators present that small-sized coke must be free from breeze to be used efficiently. In addition to the results secured from the use of nut coke in the company's blast furnace, Mr. Rogers stated that nut coke was also successfully used in the cupola of their foundry making small castings.

A report of tests made on burning properties of coke was made by Mr. Tillinghast, and he will, in conjunction with the committee on standards, continue his experiments in this connection.

H. E. Bourne, of Oglebay, Norton & Co., Cleveland, brought up the question of the serious shortage of cars, stating that in his opinion the Interstate Commerce Commission should revert to the 1918 plan of car distribution, at the Lake ore docks. It was the sense of the meeting that cars should be distributed on the basis of furnace requirements, instead of boat capacity, as is being done, with the result that some interests are now getting more than their fair allotment, and a telegram was dispatched to the director of service of the commission urging that a more equitable distribution of cars be made.

A discussion also took place on the proposed freight rate increase, and while no opposition to the railways getting fair compensation was expressed, it was felt that the freight rate on iron ore from mine to vessel should be reduced.

The committee on furnace rating reported progress, and a discussion followed as to the best methods of securing accurate ratings. This question will be taken up again at the next meeting, when more data will be available.

The association is endeavoring to secure a standard method of sampling ore and coke at furnaces, and several plans were suggested, but no definite action taken, the whole question being referred to the committee on samples and analysis.

Mr. Rogers' Paper

Mr. Rogers' paper follows:

"On Jan. 8, 1920, the blast furnace of the Norton Iron Works at Ashland, Ky., was forced to bank on account of its inability to secure coke. There was absolutely no furnace coke offering on the market at that time. Incidentally, in response to inquiries sent out by the Norton Iron Works we were offered a tonnage of egg-size domestic coke. The question arose quite naturally, Will the furnace operate on egg coke? In the absence of any established precedent, the writer ventured the opinion that it would give satisfactory results—not as good as all standard coke, but it would make it possible to operate the furnace and not be forced to suspend operations indefinitely.

"The management, acting on this suggestion, purchased 9000 tons of egg coke with the feeling that it was more or less in the nature of an experiment. On Jan. 31, we had received a sufficient amount of egg coke to start the furnace. This was done and the furnace worked normally, making foundry iron averaging 3 per cent and over in silicon and all low sulphurs. The output for ten days, including the day of starting up, averaged 155 tons per day; the volume of blast was less than normal, ranging 18,000 to 24,000 cu. ft. per minute, with fuel consumption around 2800 lb., blast pressure from 12 to 15 lb., burden ratio, 1.6 to 1. On Feb. 9 we were still using 100 per cent egg coke. Silicons had been ranging from 2½ per cent to 3 per cent, output 200 tons per day; coke consumption, 2500 lb.; burden ratio, 1.75 to 1; blast pressure, 12 to 15 lb.

"At this date, acting upon a suggestion from Mr. Colville, of Eaton, Rhodes & Co., we used walnut size coke in our furnace for the first time. On Feb. 10, 11 and 12 respectively we used a 50-50 mixture of egg and walnut size coke, and under the most careful observations we found practically the same operating conditions as heretofore, with this exception—the furnace came up hotter and we increased the blast volume about 5 per cent. From Feb. 13 to 25, 100 per cent egg coke was used and from the latter date on to the close of the month we ran on a 50-50 egg and walnut mixture; output 200 tons per day of foundry averaging 2½ per cent silicon, sulphurs under 0.030; coke consumption, 2400 lb.; burden ratio, 1.80 to 1; blast volume, 24,000 cu. ft. per minute; blast pressure, 11 to 13 lb.

"The month of March we ran two days on foundry, 23 days on Bessemer, six days on malleable; fuel 50-50 egg and walnut. The tonnage for the month was 6970, or 225 tons per day; fuel consumption, 2380 lb.; blast volume, 26,000 cu. ft.; blast pressure, 12 to 14 lb.; burden ratio, 1.9 to 1; silicon, 1.20 to 2.5 per cent, all low sulphurs.

"On April 10 all of the egg coke was consumed and no more available, so we were forced to run on 100 per cent nut coke from April 10 to 17, when we were in position to obtain some furnace coke on account of the conditions following the switchmen's outlaw strike of April 14. The result of the six days' run on 100 per cent nut coke are as follows: April 11, 225 tons; 12th, 180; 13th, 180; 14th, 215; 15th, 210; 16th, 205; total, 1217; average, 208 tons per day. From the first to the 14th of April, tonnage produced was 2811, made on 50-50 egg and nut for 10 days, and six days 100 per cent nut. The average for the remainder of the month from the 17th on, using 50-50 egg and furnace, was 215 tons; fuel consumption, 2350 lb.; blast pressure, 10 to 12 lb.; blast volume, 26,000 cu. ft. The month of May is summarized as follows: May 1 to 23, 50-50 furnace and nut; 24 to 29, 100 per cent nut; 30 and 31, 50-50 furnace and nut; tonnage for month, 5900; coke consumption, 2500 lb. Since June 9, we have been running on all nut coke. Due to a shortage of limestone, we were compelled to slow down in the driving of the furnace, but within the past few days we have been relieved in this respect and have been able to drive the furnace faster. Yesterday, June 17, using all nut coke, we produced 190 tons of standard Bessemer, silicon 1.55 and over; burden ratio, 1.75 to 1; blast volume, 26,000 cu. ft.; blast pressure, 12 to 14 lb. The blast temperatures have been uniformly about 900 degrees Fahrenheit, covering the period described in this paper.

Conclusions Not Definite

"The foregoing are simply the results of the operation of this particular furnace rather hastily presented

to you. The writer regrets that he has not more time to devote to the preparation of this paper so that it could have been presented in a more concise form. The data are rather unsatisfactory as a basis to draw any very definite conclusions. We have learned, however, at this plant that it is possible to produce pig iron using 100 per cent nut coke. Since May 1, a large percentage of our coke charge has been chestnut size, probably 60 per cent, with 40 per cent walnut, and at times 100 per cent chestnut. The walnut size coke passes over a 1-in. and through a 1½-in. screen, while the chestnut passes over a ½-in. and through a ¾-in. mesh.

"So long as the nut coke is clean and necessarily dry, with no dust adhering to it, it gives no trouble in the furnace. On the other hand, when it is wet and contains coke dust and breeze, even when clinging to the larger pieces of coke, it has invariably caused slight hanging and slipping of the furnace, but so far at our plant it has not been more serious than to necessitate an occasional checking of the furnace.

"I wish to emphasize the fact that during this campaign of using nut coke, it has been made on an old furnace. This furnace was blown in on Sept. 9, 1915, and has run continuously with the exception of a period of six months from Jan. 9, 1919, to July 1, 1919, and has produced something over 340,000 tons of pig iron to date.

"The bosh was very thin when the furnace was blown in on July 1 last, the bosh plates being exposed from 10 to 14 in. in places. It has been necessary to build up the bosh by using smaller openings in the tuyeres than would be used on a new lining. It is to be hoped for the good of the fraternity that someone may carry on the experiment of using nut coke on a normally working furnace with a proper lining. I believe the results obtained will be satisfactory and perhaps startling.

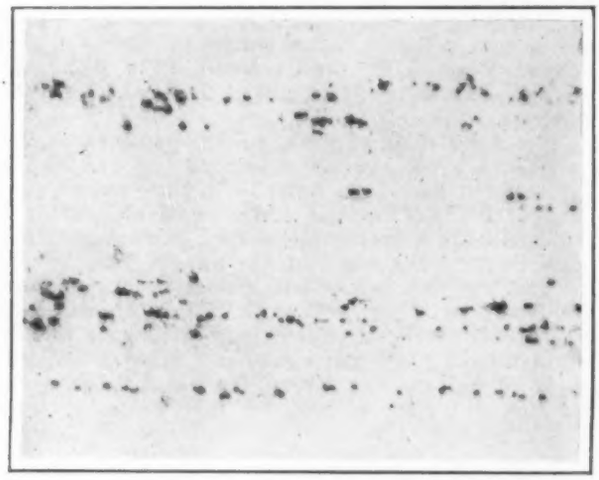
"In closing, I wish to state that there is one fact which seems to stand out from among all the rest among blast furnace managers, and that is that the observance of precedents deters us all from often attempting many things in the operation of a blast furnace that might prove to be of practical benefit to the industry at large. Personally, had I been given the choice between furnace coke and nut coke, I do not think I need to voice the answer here, but when it was a question of nut coke or quit, I believe you have the answer in the few facts I have endeavored to give you."

SULPHUR SEGREGATION

Aluminum Additions as a Preventive—Effect of Titanium

BY GEORGE F. COMSTOCK*

THE article in THE IRON AGE, May 20, on "Aluminum Additions and Sulphur Segregation," though probably correct in its facts as far as they are stated, does not go into the subject deeply enough to avoid giving an erroneous impression as to the effects of aluminum additions. The author of the article in question brings out the fact that by killing soft steel with aluminum, segregation may be prevented, and also concludes that it is better to add the aluminum all through teeming of the ingot, rather than only at the top.



Photomicrograph, 200 Dia., of an Unetched Section of Soft Steel Killed in the Mold with Aluminum

The photomicrograph is one of a piece of soft steel which was killed in the mold with aluminum. It shows an unetched section, magnified 200 diameters. The black specks are alumina particles, which were found in practically the same abundance in every specimen examined from this ingot of steel. Streaks of alumina like this have been known to cause serious failures of steel, and they nearly always appear in steel killed with aluminum. In ingots treated only at the top with aluminum there is less danger of forming such bad streaks of alumina, and this difference is a much more important reason for confining the addition to the top than is any reason which the author gives for making the addition throughout the teeming.

It is quite well known that killing steel with any deoxidizer, either aluminum, silicon or titanium, will prevent segregation, but if either of the first two is used, the steel is always contaminated with alumina or silicates, and the result is a dirty product. Ferro-carbon-titanium can be used for this purpose without making the steel dirty, and it is unique in being the only deoxidizer which can give this result. It should not be added in the molds, however, but in the ladle about 10 min. before the ingots are teemed. Different quantities are used in different kinds of steel according to the results desired, but usually in soft steels only from 2.5 to 5 lb. per ton are used, which is not sufficient to kill the steel. Makers of the highest quality of soft steel for sheets, plates, etc., usually prefer to allow the gases to escape from the steel in the molds rather than to completely kill it. When titanium is used this can be done without any serious segregation of sulphur, as is shown by the following figures, taken from tests at several different mills:

Structural steel, about 0.25 per cent carbon, sampled after 5 per cent discard:

	Per Cent
Titanium treated, sulphur at edge	0.026
Titanium treated, sulphur at center	0.029
Aluminum treated, sulphur at edge	0.024
Aluminum treated, sulphur at center	0.043

Sheet-bar steel, about 0.12 per cent carbon, sulphur as follows:

Treatment	Location in Ingot	Edge of Bar	Center of Bar
Plain	Top	.024	.046
	Middle	.027	.030
	Bottom	.022	.021
Titanium-Treated	Top	.025	.036
	Middle	.021	.039
	Bottom	.024	.023
Plain	Top	.040	.050
	Middle	.029	.029
	Bottom	.030	.029
Titanium-Treated	Top	.030	.040
	Middle	.029	.029
	Bottom	.026	.027
Plain	Top	.036	.070
	Middle	.038	.043
	Bottom	.038	.040
Titanium-Treated	Top	.050	.056
	Middle	.043	.041
	Bottom	.041	.045

*Metallurgist, Titanium Alloy Mfg. Co. Niagara Falls, N. Y.

The Detroit, Toledo & Ironton Railroad is spending more than $1,000,000 for new rolling stock and rails. Fifteen locomotives have been added to the equipment, and the first consignments of an order for 300 box cars have been received. Four thousand tons of new 100-lb. rails is being laid at Lima, O. During the last eight months the D. T. & I., it is announced, handled the greatest traffic in its history, without placing a single embargo where the road was able to obtain prompt acceptance, either with connections or consignees.

STEEL PILED HIGH

Slow Progress at Youngstown in Improving Conditions—Lower Steel Prices Expected

YOUNGSTOWN, OHIO, June 22.—At the close of the week, approximately 500,000 tons of finished steel glutted mill yards and warehouses, indicating that railroads are making little headway against production. This piled tonnage included plants throughout the Youngstown district. Coal shipments continue adequate for operating requirements. Belief prevails that output in the last half of the year will be greater than in the first half, but managers expect many difficulties, due to the straitened transportation situation. Steel demand is brisk and promises to keep up, but the industry faces an indefinite period of delayed and belated shipment of product, in the opinion of leading executives.

Sheet production in the Mahoning Valley is at the average rate of 80 per cent of normal. New uses for sheet steel are constantly being devised, and there seems to be no limit to the demand, declare makers, who have no apprehensions that capacity has been overreached due to extensions in the past three years. Additional sheet productive capacity is being planned by Valley interests, while the Republic Iron & Steel Co. is engaged in a comprehensive extension program at its DeForest works at Niles, whose capacity is to be doubled. The construction program at the DeForest plant involves four or five years of activity and the expenditure of several million dollars.

In view of the difficulties attendant upon deliveries, makers of sheets are concentrating their energies upon the regular trade. Deliveries are now being made at prices much below current quotations, the business having been booked several months ago. There is a marked easing up in demand for blue annealed and it is likely several makers will be in position to entertain new business shortly. Some price recessions in all grades of sheets are expected. The spread on galvanized is from 8.50c. to 9.50c., on black 8c. to 9c. and on blue annealed 6.50c. to 7c. It is believed makers will be in much better position by the end of the quarter to consider new specifications.

Heavier Movement of Pipe

The Youngstown district is a large producer of pipe and output is now on a more satisfactory basis than a month ago. Large tonnages are going to the mid-continent and southwestern oil fields for oil casing, and the demand from this source is unabated. The most satisfactory shipments have been made in trainload consignments. Makers of both wrought iron and steel pipe are heavily oversold. The leading maker will start a large unit this quarter which will be devoted solely to the larger sizes of lapweld. Output was considerably checked during the last three months and for that reason large orders still remain on the books of the principal producers. Some mills are booked for the remainder of the year on both lapweld and buttweld.

The Carnegie Steel Co. has placed its recently completed 18-in. band mill at the McDonald works in commission. The unit was completed June 1 and has undergone thorough trial tests. Five mills are now active at this works and four others are to be installed.

Blast furnace schedules are unchanged, with 20 active stacks out of 25 in the Mahoning Valley. Furnaces which are not supported by by-product coke oven units and must depend for their coke supply upon outside sources are encountering serious operating difficulties. Coal supply for by-product batteries is assured by reason of a priority ruling, but coke is not thus favored. Furnaces of the Carnegie Steel Co., A. M. Byers Co., Struthers Furnace Co, and Sharon Steel Hoop Co. are in this category and managers report output is affected.

Steel Mill Operations

No. 1 blooming mill of the Youngstown Sheet & Tube Co., which has been operating on one turn, was put on double turn this week. The rod mill suspended owing to the fact that the wire mill has supplies for the time being.

Republic Iron & Steel Co. is operating on an 80 per cent basis, and this week added No. 2 10-in. mill to the operating units.

Trumbull Steel Co. added 10 sheet and tin mills to the active list this week and is operating as closely to normal as fuel and transportation will permit.

Brier Hill Steel Co., the largest district sheet and plate producer, is operating these units on an 80 per cent basis.

Upon request of committees of employees, the Sharon Steel Hoop Co. has returned to the old basis of starting its Haselton hot mills at 6 o'clock Monday morning. About three months ago, the first shift was changed to start at 11:45 Sunday evening, as is the practice in a number of other mills. The men complained, though, that they were unable to rest during the hot weather after completing the first shift at 8 a. m. on Monday, and asked for a return to the old plan.

Failure of the manufacturers to reach an agreement with employees in the sheet mills is holding up some contracts for sheet bars. Consumers as a rule prefer to know the outcome of the yearly conference before placing their contracts. Most of the second quarter rollings are now being completed. Much of the output is being stocked, though nearby consumers are having their requirements filled. The price of open-hearth sheet bars is unchanged at $75.

A large dealer in plate ends is finding a ready market for his commodity and is sending much material abroad, to China and Japan.

In the Shenango Valley, the Fannie furnace at West Middlesex has been blown out and will be overhauled. No. 2 furnace of the Carnegie Steel Co. at Farrell has suspended and will be rebuilt, its capacity to be enlarged from 350 to 500 tons.

Failed to Prevent Meeting of Dominion Steel Corporation

At the annual meeting of the shareholders of the Dominion Steel Corporation, held in Montreal, June 18, the directors who, the day before, tried to secure a legal injunction to postpone the meeting on the ground that they wanted more information about the proposed British Empire Steel Corporation, were not re-elected to the board. The directors who opposed the holding of the meeting were: J. H. Plummer and E. R. Wood, Toronto, Ont.; William McMaster, George Caverhill and John Raoul Dandurand of Montreal, Que. The new board elected consists of Viscount Furness, Sir Clifford Sifton, Sir Henry Pellatt, Sir William Mackenzie, Sir William D. Reid, Hon. Frederick Nicholls, Stanley Elkins, M. P., Hon. Charles Beaubien, H. B. Smith, Edmund Bristol, J. W. Norcross, Sir Newton Moore, Benjamin Talbot, J. F. Stewart and Roy M. Wolvin.

A special meeting of the stockholders of the Nova Scotia Steel & Coal Co., New Glasgow, N. S., will be held June 25, for the purpose of considering and approving an agreement entered into between the company and the British Empire Steel Corporation on May 26 last.

Slow Shipment to Sweden

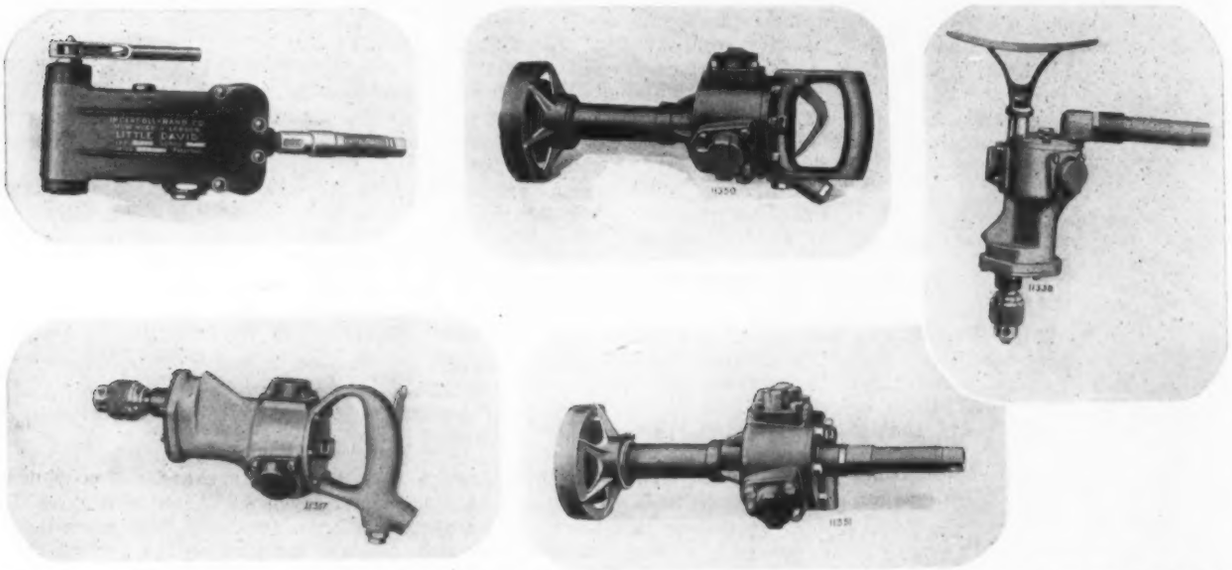
WASHINGTON, June 22.—Consul Walter H. Sholes reports from Goteborg, Sweden, that consumers of iron and steel in that country are eager for American products, but with the rise in prices and the high rate of exchange, serious obstacles are being encountered in their importation. Besides this must be added the uncertainty of delivery, which is another feature which will prove a bar to future business, if not remedied. It was stated that deals closed in August for delivery in November had not been executed at the end of February of this year. In the meantime the rate of exchange had advanced, causing heavy losses to the Swedish buyers.

American firms, Mr. Sholes says, seem to insist on money being deposited long before the goods are shipped, whereas the Swedish importer in trading with England and Germany has been accustomed to 30 days, with one and two per cent discount for cash.

New Sizes of Small Pneumatic Tools

Several new sizes of small portable pneumatic tools have recently been added to the line of Little David pneumatic tools, manufactured by the Ingersoll-Rand Co., 11 Broadway, New York. The new tools include a small size of close quarter drill to be known as No. 8, a small high speed pneumatic grinder in two types, Nos. 601 and 602, and a lightweight drill furnished in two styles, Nos. 6 and 600. These new tools have been developed to satisfy the demands for a light weight, high speed machine for certain classes of work, for which the heavier tools were not entirely adapted.

The No. 8 close quarter drill is for use where the ordinary machine is not suitable, as close to a wall or corner. It runs at 250 r.p.m. without load, but will handle drilling, reaming or tapping up to 1¼ in. diameter. The spindle which turns the drill, reamer or tap is operated by three rocking levers connected directly to the pistons through connecting rods. The motor is of the three cylinder type with pistons acting at right angles to the levers. A steady, continuous movement of the spindle is obtained, as one ratchet pawl is always in contact with a tooth of the spindle.



New Ingersoll-Rand Pneumatic Tools Designed for Light Weight and High Speed. Reading from left to right, the tools are the No. 8 close quarter drill, No. 601 grinder, No. 600 drill, No. 6 drill and No. 602 grinder

The No. 601 and No. 602 grinders with a free speed of 4200 r.p.m. are suitable for grinding, buffing or polishing work of a varied nature. Both machines have the same motor, but are equipped with different throttle and handle, the No. 601 having the closed type of inside trigger handle, while the No. 602 is fitted with the rolling type of throttle handle. A special feature of these tools is the three cylinder motor—different from that of the No. 8 drill described above—which runs constantly in a bath of oil. The valve is made integral with the crankshaft, simplifying the design, and the piston and connecting rods are of special construction. Ball and roller bearings are used throughout. The removal of a few screws enables the handle to be lifted off and exposes the entire mechanism for inspection.

The No. 6 and No. 600 drills are designed for drilling small holes without breakage of drills. They will handle twist drills from the smallest size up to ⅜ in. diameter. The free speed at 90 lb. air pressure is about 2000 r.p.m. The two machines differ essentially in the handle construction, the motors being the same. The No. 6 has the pistol grip type of handle, while No. 600 is furnished with breast plate and rolling throttle handle. Aluminum, reinforced with steel bushings, is used wherever possible, the No. 6 machine weighing only 9 lb. The motor is a three cylinder type, somewhat similar to that used in the grinders described above. The cylinders are separate iron castings, explained as accessible, renewable and interchangeable. A sensitive throttle control and freedom from vibration are emphasized as features. The bearings are all either ball or roller type.

Business Conditions at Detroit

DETROIT, June 21.—A recent questionnaire sent out to Detroit manufacturers and machine tool dealers by a local publication indicated that the feeling was decidedly optimistic. The general opinion may be outlined as follows:

Business is satisfactory, although there has been some falling off in purchases during recent weeks. The transportation and labor situations are improving. Business is doing just as much as possible under the circumstances—probably better than might be expected. The Federal Reserve system is able to weather any storm. The public is retrenching in buying, and the result is likely to be a softening of prices about the first of next year.

The demand for Detroit automobiles is not so strong as it was 60 days ago.

Machine tool manufacturers and dealers think that rumors that have been spread recently have caused the small concerns to hold off in placing their orders, but the larger companies are not doing so. They all say that business is good, considering the conditions, and will get better before autumn.

Freight Rate Hearing

WASHINGTON, June 22.—Views of shippers have been heard in the hearing of the Interstate Commerce Commission during the past week on proposed increased freight rates. As a general proposition the shippers have not opposed such increases as may be considered proper by the commission. In some instances, however, objections have been made to specific increases proposed, as, for instance, to freight rates on sand and gravel, which it has been claimed would mean an increase of $1,000 per mile in the cost of road building.

Maintenance of existing equalizations and relationships of rates has been the chief consideration of many of the different classes of shippers.

Coal operators were among those appearing before the commission during the week. It was the opinion of most of them that they were content to leave the measure of increase to the commission. Somewhat similar statements were made by the grain interests.

Directors of the Providence Gas Co., Providence, R. I., are considering the installation of a new hoist having an oven feeding capacity of 800 tons, which would bring the company's coking unit up to a forced normal output basis. The company's hoisting capacity is about 700 tons daily. The coke output averages about 560 tons daily, but with the new hoist it would easily reach 625 tons. In connection with the proposed new hoist, the directors are considering the installation of a new battery of coke ovens.

Drop Forgers Meet at Atlantic City

Pulverized Coal, Accident Prevention, Standardization, the Company Store, Up-setters and Forging Machines—Topics at Annual Convention

TECHNICAL and commercial problems of live interest in the drop forging industry were discussed at the seventh annual convention of the American Drop Forge Association, held at the Marlborough-Blenheim Hotel, Atlantic City, N. J., June 17, 18 and 19. An attendance of 340 members and guests was recorded, 190 of these registering with the drop forge association and 150 with the supply association.

Three sessions were held, Thursday afternoon and Friday morning and afternoon. The opening session scheduled for Thursday morning was omitted owing to the absence of many members due to arrive on a midday train. This necessitated the omission also of the address of welcome by the mayor of Atlantic City planned for this session. At the closing session on Friday afternoon, resolutions of respect and sympathy on the death of David M. Motherwell, a member of the association and a pioneer in the drop forge industry, were adopted. At this session also officers for the ensuing year were elected as follows:

New Officers

President, Ferdinand Barnickel, Indianapolis Drop Forging Co., Indianapolis.

Vice-president, J. P. Hopkins, Atlas Drop Forge Co., Lansing, Mich.

Treasurer, T. W. Siemon, Union Switch & Signal Co., Swissvale, Pa.

Secretary (To be elected and announced at a later date).

Directors, William E. Crocombe, Ajax Forge Co., Chicago, chairman; R. T. Herdegen, Dominion Forge & Stamping Co., Walkerville, Ont., (re-elected); H. D. Stoddard, Wyman & Gordon Co., Worcester, Mass., (re-elected); F. A. Ingalls, Ingalls-Shepard Forge Co., Chicago, (re-elected); J. F. Connolly, Champion Machine & Forge Co., Cleveland; F. W. Trabold, J. H. Williams & Co., Brooklyn, (re-elected); C. A. Brauchler, Canton Drop Forge Co., Canton, Ohio; E. J. Frost, Frost Gear & Forge Co., Jackson, Mich.; T. W. Siemon, Union Switch & Signal Co., Swissvale, Pa.

The Drop Forge Supply Association re-elected its officers as follows:

President, H. N. Taylor, N. & G. Taylor Co., Philadelphia.

Vice-president, Charles Harmon, National Machinery Co., Tiffin, Ohio.

Secretary-treasurer, A. W. Wurster, Philadelphia representative Heppenstall Forge & Knife Co., Pittsburgh.

The membership of the executive committee was changed, Paul J. Driscoll, Tacony Steel Co., Philadelphia, and J. A. Murray, Ajax Mfg. Co., Cleveland, being elected.

New members were elected on the entertainment committee as follows: Stuart Hazlewood, Midvale Steel & Ordnance Co., Philadelphia; Floyd Rose, Heppenstall Forge & Knife Co., Pittsburgh; Guy A. Hagan, Lackawanna Steel Co., Buffalo, (re-elected). The chairman and one additional member will be added to this committee when the place of holding the next annual meeting is decided upon, these two to be local members.

Jules Dierckx, Keller Mechanical Engraving Co., Brooklyn, was re-elected chairman of the membership committee. The other members are D. J. Crowley, National Machinery Co., Detroit, and J. E. Williams, forge engineer, Philadelphia.

Forge Shop Lubricating System

E. J. Frost, of the Frost Gear & Forge Co., Jackson, Mich., president of the association, in opening the convention, explained that owing to the omission of the morning session, the customary addresses would be omitted, and then announced the first paper. The main points of the papers and the discussions follow.

The problem of supplying the proper amount of lubricant to the steam drop hammer in actual practice was discussed by Harry Johnson, Ingalls-Shepard Forging Co., Harvey, Ill.

"This can be gotten at best," he said, "through a series of tests conducted on one or more hammers. Inasmuch as the quality of steam supplied the hammer has considerable bearing on its successful lubrication, it is better to select one hammer for test at the extreme end of the steam line from the boiler plant, as a greater per cent of moisture will be found in the steam at this point. Should this water be allowed to go over into the hammer with the steam, the oil would be washed off the wearing surfaces faster than the lubricator could supply it.

"This moisture can be separated from the steam in a measure by placing a suitable cross in the steam main, taking the steam supply for the hammer off the top of the cross and draining the main through the lower opening of the cross with a suitable drip pocket and steam trap.

"In fact, the success attained with any lubricating system in connection with steam cylinders depends on the layout of the steam line and the method employed in draining."

The speaker then gave details of a test on a 12,000 lb. steam drop hammer, made with the object of securing an oil that would lubricate the hammers economically, leaving the exhaust steam comparatively clean for heating purposes. This result, it was explained, was obtained with a product composed of a full filtered cylinder stock compounded with an acidless tallow oil. The oil was 22 Baumé at 60 deg. Fahr. and cost $0.55 per gal. delivered.

The arrangement of a 2-quart 4-feed motor driven mechanical lubricator with its distributing system used to supply this oil was described in detail. The lubricator was centrally located in relation to the four hammers and 4 ft. from the floor in a steel cabinet, convenient to the oiler. An electric heater was located directly under the heater case, and the oil was discharged into the steam through a siphon atomizer. A variation in the quantity of oil supplied to any one hammer from one quart in 7½ hr. to one quart in 45 hr. was found ample to lubricate any one of the hammers ranging from 1000 lb. to 14,000 lb. in weight, one drop of oil per minute being supplied for each 2 sq. ft. of wearing surface involved in the circular area of the cylinder and that portion of the piston rod that passed through the piston rod packing.

Cost figures on this lubricating system were given by the speaker. Originally the 12,000 lb. hammer was supplied with oil by a one quart steam lubricator located up on the steam line feeding the hammer, at a cost for labor and oil of $1.47 per 24 hr. This was contrasted with a total cost for oil, maintenance and power charge for the heater when the mechanical lubricator was installed, of $0.41 per 24 hr., representing a saving for the mechanical lubricator of $1.06 per day.

Due to the constant shock the steam lubricator is subjected to when located upon the steam supply pipe, feeding the hammer, it was found next to impossible to adjust the amount of oil supplied the hammer to any degree of accuracy. This was especially true on the larger hammer during the winter months.

Forge Shop Finances

A paper of particular interest to forge shop executives was that presented by C. Oliver Wellington, Scovell-Wellington Co., Boston, giving the details of a

cost system for forge shops. "A cost system is of no value," he said, "unless the information it gives is used as a basis for executive action." The speaker emphasized the need for holding conferences of the executives, superintendents and foremen to discuss cost figures thus to stop leaks and attain better co-operation.

In a discussion of the paper, Edgar E. Adams emphasized the need for keeping records of individual units, "score cards," and then letting the men in the shop know the "scores" that were being made, thus to bring the individual performance into prominence and promote interest and a spirit of rivalry, a method similar to that used to such good advantage in giving publicity to the players' performance in baseball.

The Company Store

Interesting information as to the operation of a company store was given in a paper by Edgar E. Adams, Cleveland Hardware Co., Cleveland. He said in part:

"The most prevalent in industrial establishments are the small peddlers who sell a particular item in which they get interested. In some cases the heads of the institutions know and sanction these departments and in other institutions they are entirely ignorant of them, and in others they are absolutely against them and they are forbidden. Nevertheless, like the publications in our prisons, they are there, and as far as I can find, there is no way of getting away from them."

The speaker then outlined how the stores department is operated by the Cleveland Hardware Co. They took their best office man, put him into the shop supply room and told every employee that the company "would buy anything from a yeast cake to a house and lot, giving them full advantage of the buying power and credit of the institution, but we would not put them under obligation to us, because we would add enough to cover all of our overhead.

"This man almost immediately showed that our factory superintendents had very little idea of the cost of the supplies they were using and immediately gathered up from the tool rooms, superintendent's and foreman's desks, etc., all manner of supplies we were using in our institution; and this really formed the basis for our large company store.

"Instead of handing out a broom, pail, files, twist drills, or anything which the foreman called for, we really sold it to him for use in his department, because at the end of the month, we rendered him a statement, showing just how much in dollars the supplies used in his department had cost. While this had little effect for the first two or three months, still as each month's invoices came out and were compared with the invoices of the month before, and different foremen began to compare amounts they were paying for supplies, we began to notice a saving.

"Foremen began to get interested in not only how the sweepers used their brooms, but in the quality and type of broom the purchasing agent was buying and this ran all the way down the line, until we eventually estimated we had cut down the expense of our shop supplies fully 50 per cent.

"We are doing a daily business in our stores department of between $300 and $400 per day. Our stores manager has connections with wholesale furniture houses, knitting mills, large wholesale hardware companies and dealers, where orders from him carried by employees of our shop will allow them to make their selections direct from their stocks, chargeable to our institution. Generally speaking, I would say it is necessary for us to add 10 per cent to the cost of an article to cover the overhead. In this way we save the employee about 20 per cent."

Saving in price, the speaker said, cut very little figure with the great majority of employees. "The greatest saving is to the company itself, in its ability to control the buying of employees during working hours. Next to that I believe there is a very great item in the control of quality."

Pulverized Coal

In answer to requests of members, C. F. Herington, Bonnot Co., Canton, Ohio, gave an interesting extemporaneous talk on powdered coal. "Pulverized coal, with all the companies," he said, "is going ahead this year faster than it has the past three years. In fact, at the present time, the oil concerns of Oklahoma and Wyoming say it is too expensive to burn oil under stills. One company is spending $18,000 per month for fuel oil under its stills. It has 10 of them. They showed to me that they can make a saving of $130,000 per year with pulverized coal, charging up the fuel oil at 6½ cents per gal. The cost of the plant completely erected in operating condition is $85,000, so that they will save that cost in about nine months.

"One of the latest converts to powdered coal is the Baldwin Locomotive Works. They have placed a contract with the Bonnot Co. for 150 forge furnaces. This will make 690 forge furnaces that will be operating on pulverized coal by the end of the year."

In answer to a question as to how pulverized coal would work out for a small forge plant of 11 to 15 hammers, Mr. Herington stated that a plant in Minneapolis is going to distribute the pulverized coal by tank wagons, and deliver the coal at a certain price plus the pulverizing cost, and make a profit of $1 a ton to the concern. "All a man has to do is to buy the coal and have the distributing system deliver it to his furnaces, and he can save the cost of installation of the burning equipment in about three months. That would be the only answer for the small installation. All of the hotels in Minneapolis have agreed to put in the pulverized coal this coming winter."

Another member inquired as to what the minimum daily consumption of fuel oil would be that it would pay to convert to powdered coal. "Three thousand gal. per day," Mr. Herington replied, "then it would pay. The plant would then pay for itself in a year. In fact, at the price oil is now, it will pay for itself in less time, because if you are paying 8 cents a gal. you are saving at the rate of $16 a ton for coal on the basis of B.t.u. value."

Concerning the accumulation of clinkers, the speaker said that "in the furnaces we have installed, we have ash or slag in the high temperature furnaces at about 2200 deg. You can slag it out of the back of the furnace if you build the hearth to a slope and take out the fire clay; you get about a pail full of slag a day. The ash does not have any effect on your work."

In answer to a question as to what effect the powdered coal has on a reheat, D. J. Granger, Sterling Drop Forge Works, Cicero, Ill., stated that "about 10 years ago we experimented on powdered coal. We bought it in bags and fed it in a hopper with low pressure air, about 7 or 8 oz., and the only difficulty we found with the heat is that the particles of ash would stick to the iron or steel, similar to the way it does to the inside of a brick furnace. It causes a little delay in cleaning. You either have to scrape it off or brush it off with a wire brush. As far as I could see, the adhesion of the ash was the only difficulty. You get all the heat you want, and I do not see any reasons why it could not be applied to drop forging, outside of that. If you leave it in the furnace too long it will scale. In an oil furnace, if you turn on more oil for heating tool steel, it would kind of protect it from getting hot. I do not think it makes any difference how fast you reheat the steel, the particles would sort of gouge the steel, and protect it from any injury."

Upsetters and Forging Machines

A paper on upsetters and forging machines presented by J. P. Hopkins, Atlas Drop Forge Co., Lansing, Mich., was in part as follows: "The forge man who knows where to draw the line between the upsetter and the hammer can accomplish a great deal in the production of forgings, as there are many jobs which the upsetter can handle more economically than the hammer, and in many cases less skill is required to operate the upsetter. The work which should be avoided in the upsetter is that which involves alloy steel where the dies are of such design as to confine the scale and press it into cavities and forging, thus causing a great deal of trouble in the machining operation.

"Where the human element enters into the work

very considerably the hydraulic upsetter has advantage over the belt-driven tool to some extent inasmuch as it can be stopped at any point in its travel, or if it continues its travel and in case of material being misplaced, it will only stop when it reaches an overload and there is little or no harm done aside from spoiling the piece of work he is about to make.

"In misplacing material in the belt or motor driven upsetter, if the operator puts his foot on the treadle there is usually a bad result, if the material is anywhere near the capacity of the tool. Breaking the crankshaft or the gears of the upsetter is what the forge man usually looks for, but invariably such breakage can be traced to carelessness or an overload.

"Turning back to some faults of the hydraulic, one is continually confronted with leaky valves or rams. Invariably the valves are packed with leather, and under continued use the high water pressure will whip them out, the same being the case with rams which are packed with flax, and this trouble does not exist in the tool alone, but is experienced with the shock valves on the lines and the accumulators and pumps."

Accident Prevention

An interesting paper on "Accident Prevention in the Forge Shop" was presented by G. A. Kuechenmeister, Dominion Forge & Stamping Co., Walkerville, Ont. The speaker outlined the various hazards and showed, with the aid of lantern slides, devices for their elimination. Means of stimulating the interest and of enlisting the co-operation of the employees were outlined. This paper will be given largely in full in a later issue of THE IRON AGE.

Standardization of Die Blocks

Several factors entering into the manufacture of die blocks which can be at least partially standardized were discussed by C. B. Porter, president Sizer Forge Co., Buffalo, and chairman of the standardization committee of Foreman's Exchange. The factors considered included sizes of blocks, steel in blocks, method of forging, annealing, and hardening treatments. This paper will be included in a later issue.

Emphasis on the need for standardizing the rate of heating each size of die blocks was made by W. C. Petersen, supervisor of materials, Packard Motor Car Co., Detroit, in a paper on the chemical and physical requirements of die blocks. The paper centered attention on those dies used in drop forge hammers, and explained the physical characteristics of die blocks made of straight carbon steel, an alloy with nickel, with chromium and with nickel-chromium. The correct combination of carbon, nickel and chromium, Mr. Petersen said, gives a high elastic limit, comparatively high ductility and greater hardness, also a very fine structure able to resist fatigue much longer than either straight carbon or nickel steel. He did not wish to be construed as saying, however, that the chrome-nickel block is the best for all purposes. The speaker analyzed causes of failure of die blocks, such as insufficient cropping, improper heat treatment and working. The most important phase in the hardening operation, it was explained, is rate of heating rather than final temperature or quenching. It was the speaker's opinion that it would pay to expend more time and money and standardize the rate of heating of each size of block. This rate of heating predetermined, he said, would make the hardening of die blocks a comparatively easy and safe operation.

The construction of boiler furnaces equipped to burn fuel was explained by Dr. W. N. Best, New York. With the aid of lantern slides the construction of various types of burners, storage tanks, oil pumping systems and different makes of boilers and types of furnaces equipped to burn fuel oil were described. The speaker showed samples of light oil, Oklahoma oil, coal tar and oil tar and explained their physical characteristics.

The relation of the laboratory in the forge shop to the control of the product was discussed by Professor John Nelson, Wyman-Gordon Co., Worcester, Mass. It was explained that from a luxury, the laboratory has come to be regarded as a necessity, and large sums of money are spent not only in commercial laboratory work but in experimental and research investigation. Laboratory facilities, Professor Nelson said, have been largely expanded as a result of the war. The speaker discussed the effects of various defects in forging billets and the methods in vogue in the laboratory for determining these defects, which must be located if poor forgings are not to result.

Entertainment Features

The exceptional facilities for entertainment available at Atlantic City were much enjoyed by both the members and the many ladies present, noteworthy features being a banquet in the submarine grill of the Hotel Traymore, followed by a theater party on Thursday evening, and banquet with cabaret and dancing at the Beaux Arts Cafe on Friday evening. The expenses of the entertainment on Friday were borne by the supply association.

J. H. Williams & Co. and Whitman & Barnes Mfg. Co. Consolidated

J. H. Williams & Co., Brooklyn, manufacturers of drop forgings and drop-forged tools, and the Whitman & Barnes Mfg. Co., Akron, Ohio, manufacturers of twist drills, reamers and wrenches have consolidated. The companies will continue to operate their plants separately: J. H. Williams & Co. at Brooklyn and Buffalo; the Whitman & Barnes Mfg. Co. at Akron, Chicago and St. Catherines, Ont.

J. H. Williams & Co. was founded in Flushing, Long Island, as a partnership in 1882, by James H. Williams and Matthew Diamond, and was known as Williams & Diamond, later becoming known as Williams & Brock. In 1884 the business was moved to Brooklyn, and in 1887 it became known under its present name, incorporating in 1895.

The Whitman & Barnes Mfg. Co. was established as a partnership in 1846 by Augustus Whitman and Alfred G. Page, under the name Page, Whitman & Co. In 1868 the factory at Akron, Ohio, was built, and in 1877 the partnership combined with George Barnes & Co., Syracuse, N. Y., assuming the present name of the company. The plant at St. Catherines, Ont., was acquired in 1882, and the Chicago plant built in 1893.

Business under the consolidation will be conducted by the personnel of the two companies as follows: J. Harvey Williams, president and managing director; A. D. Armitage, vice-president, W. A. Watson, secretary and treasurer; F. W. Trabold, general sales manager; Capt. W. N. McMunn, general works manager; Willard Doud, chief engineer; J. C. Scanlon, general purchasing agent, and W. J. Elliott, Canadian manager.

Foundries and Machine Shops in Canada

WASHINGTON, June 22.—The total capital invested in foundries and machine shops in Canada in the year 1918 amounted to a total of $84,122,446, according to a survey made by the Dominion Bureau of Statistics, the results of which have been recently announced.

The report covers 667 plants, 369 in Ontario, 126 in Quebec, 69 in British Columbia, 25 in Saskatchewan, 23 in Nova Scotia, 23 in Manitoba, 15 in Alberta, 13 in New Brunswick and 4 in Prince Edward Island.

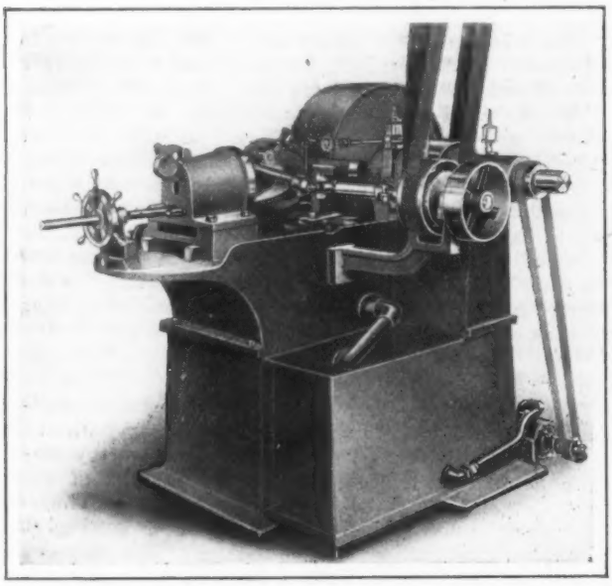
The total capital invested in the industry consists of land, building and fixtures, $23,151,316; machinery and tools, $18,778,111; materials on hand, stocks in process, finished and operating accounts, and bills receivable, $18,822,416. Ontario leads with a capital investment of $56,880,631, Quebec is second with a total of $14,276,674, British Columbia third with $3,635,563, and then follow Manitoba with $2,781,536, New Brunswick with $2,623,056, Novia Scotia with $2,007,191, Alberta with $1,176,932, Saskatchewan with $508,423, and Prince Edward Island with $232,440.

Precision Centerless Cylindrical Grinder

A centerless cylindrical grinder designed to eliminate elaborate adjustments and set-ups and the necessity of carefully educating an operator for this highly specialized work has been developed by the F. C. Sanford Mfg. Co., Bridgeport, Conn. It is known as the model B grinder and is being placed on the market by Russell, Holbrook & Henderson, Inc., 30 Church Street, New York.

The machine consists of a grinding wheel, run at regular grinding speed, opposed to a feed wheel running in the same direction but at much slower speed, and inclined at a variable angle to determine the rate at which the work is fed past the wheel. Between the grinding and the feed wheel are located ways for guiding the work. The work is fed by hand or by gravity in a chute. The grinding wheel is 20 in. in diameter by 4 in. face. The bearings are located on either side of the driving pulley, and have provision for quick adjustment for wear.

The carriage is dove-tailed into the main base, gibbed for adjustment for wear. This carriage, which supports the feed wheel, is actuated by a capstan wheel carrying a nut which engages the screw operating on the feed wheel through double spiral springs. The capstan wheel carries a dial graduated in thousandths. The feed wheel shaft is mounted in brackets which are trunnioned on a hub, thus providing a means of varying the inclination of the shaft. A dial showing the amount of the inclination is provided. The wheel can be set to feed in either direction. The shaft is driven by a universal joint, allowing the wheel to be inclined at the desired feeding angle and still maintain a permanent position and location for the driving pulley which is held by a bracket to the frame. An auxiliary pulley is placed on the end of this shaft for use only when truing the wheels. When dressing the wheel a means is provided for disengaging the feed wheel driving pulley so that it is not necessary to remove the belt when running at this high speed. The feed wheel is 10 in. in diameter by 4 in. face, and runs at a speed of about 48 r.p.m. An adjustable device is fitted to the wheel hub to take up lost motion.



Elimination of Elaborate Adjustments and Set-Ups and the Necessity of Carefully Educating an Operator Were the Purposes in Designing the Model B Sanford Grinder

The frame is of the box type and is provided with a tank made in two sections—one for settling and one for supply. The flow of water is regulated by an angle valve in a convenient position for the operator.

The truing device is hinged on a horizontal shaft bolted to the side of the frame and when not in use is swung back and along this shaft out of the way. The other end of the truing device has a solid rest on the frame and when in truing position is parallel with the grinding wheel shaft. The two diamonds opposite each other are drawn across the faces of the two wheels with one movement, thus making the sides of the path of the work parallel.

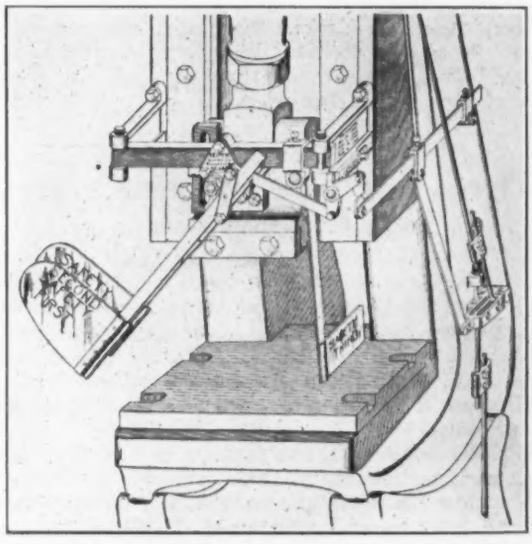
The work rest is a cylindrical rod held in place in the work rest support. Its diameter is anything less than the diameter of the work to be ground. This rest and its relation to the grinding and feed wheels is explained as the basic reason for its ability to take heavy cuts and maintain accuracy. The rest is set below the center of the wheels, so that when the wheels are brought in contact with the work, the center lines of the wheels are above the center line of the work. The work, being held from three almost equal points, cannot jump or whip and can only move endwise as dictated by the feed wheel. The work rest support is hinged to the horizontal shaft in the same manner as the truing device and is swung upward and along this shaft so as to be out of the way for truing.

Guard for Punch Presses

A guard of the double vane type for punch presses is announced by the D. & M. Guard Co., 6 State Street, Rochester, N. Y. The two vanes or guards swing as pendulums from the same stud on the bridge. They normally stand at the left and swing to the right and return. One of these guards, Safety First, swings outside of the bridge and is moved by every stroke of the treadle. The other guard, Safety Second, swings inside the bridge and is moved by every stroke of the ram. Each guard moves independently of the other. The outer guard swings gently to the right and thereby pushes the operator's hand out of danger. The inner guard follows immediately thereafter.

The inner guard gets in its work when the ram repeats unexpectedly after the treadle has been raised, as when the spring breaks in the clutch. In such cases, the outer guard stands idle at the left because the treadle is raised, but the inner guard infallibly swings to the right because it is driven by the ram. The inner guard never touches the operator's hand except in just such an emergency and then kicks it quickly out of danger.

The press is guarded on the side with a blinker or side guard, Safety Third, that swings from the bridge and prevents the operator from feeding the press from the side.



Punch Press Equipped with Guards of Double Vane Type. One guard is moved by every stroke of the treadle, the other by every stroke of the ram. A third guard prevents the operator feeding the press from the side

The bridge which carries all three guards is hinged at the left and locked by a pin and padlock on the right. The pin can be unlocked and quickly withdrawn and the bridge can be swung around to the left, completely removing the bridge and guards from the front of the press. This makes the pitman, press head and tools completely accessible.

Oxygen Enrichment of Air in Metallurgy

Application to the Blast Furnace—Possibilities in the Open-Hearth Furnace, the Converter and in Gas Producers

A PAPER on "The Future of Oxygen Enrichment of Air in Metallurgical Operations," by F. G. Cottrell, director, Bureau of Mines, Washington, was presented at the spring meeting of the American Iron and Steel Institute in New York, and dealt extensively with the production of oxygen and other phases of the subject. Portions of the paper dealing with the use of oxygen in the manufacture of iron and steel are given below, followed by a discussion by C. A. Meissner, chairman blast-furnace committee, United States Steel Corporation, 71 Broadway, New York:

Speaking in round figures, merely to give a bird's-eye view of the present oxygen industry in relation to what expansion and changes in application to major metallurgical operations would mean, the present production of the United States is about 3,000,000 cu. ft., or 130 tons, of oxygen per day, over 95 per cent of which is probably used in torches for cutting and welding purposes.

The Production of Oxygen

The one-quarter of this produced by electrolysis comes from several hundred privately owned plants, many of them quite small, and producing gas only for their owners' uses. The remaining three-fourths of the supply comes from about 50 air liquefaction plants owned and operated by the Linde Air Products Co., using the Linde process, and the Air Reduction Co., using for the most part the Claude process, but with still some production from the old Hildebrand process. The first of these two companies is the older and has somewhat the larger production. Practically the whole product from both companies is compressed into steel cylinders and sold to the trade.

The largest single installation for air separation ever erected was in connection with the cyanamid nitrogen fixation plant built for the Government at Muscle Shoals, Alabama, during the war. This consists of 30 of the largest size of Claude units. It was built primarily to secure nitrogen, but if operated at full capacity for oxygen would be just about equal in output to this country's total production as given above, and this in turn is just about equal to the amount of oxygen blown in as air to one full-sized iron blast furnace making approximately 500 tons of pig iron per day. The United States average daily production of iron last year was equivalent to that of about 170 such furnaces running every day in the year.

Oxygen in the Blast Furnace

The possible effects to be expected from oxygen enrichment of the air stream must be rather carefully distinguished under several different heads. The effect which we are most apt to think of first is simply raising the temperature. This may be beneficial and important in some cases, but most of our present metallurgical processes are already standardized to pretty definite temperatures for very good reasons, and if enrichment of air is applied to them, the chief reasons will probably be other than for a temperature change per se. In fact, many temperatures in metallurgical operations are more definitely defined by the character of the charge than is always recognized even by those most familiar with practical operation.

This is particularly so in blast furnace operations, for if more heat units are supplied or less taken away the furnace simply runs faster, but the temperatures of the metal and slag can vary only slightly, as these are nearly though not quite completely determined by the composition and consequent melting point of the charge. The temperature of the coke and gas current in the furnace, especially in its lower portion, may, of course, rise very considerably and this in turn slightly superheat the metal and slag as they fall through the lower part of the furnace filled chiefly with coke.

The most important way in which enrichment of blast may essentially influence blast-furnace temperatures is indirectly by allowing variations in composition of charge, e. g., making of ferrosilicon or ferrochromium directly in the blast furnace. In the case of the open-hearth, and especially the converter, the temperature question is a more pertinent one, as their operation is not controlled by the melting and automatically flowing away of their charges.

On the other hand, the distribution of heat between the hearth and shaft of the blast furnace is tremendously influenced by enrichment of the blast with oxygen because of the diminution of the total amount of gases going up the shaft per unit of carbon burned. It must be remembered that the blast furnace is, of all our metallurgical equipment, the most complicated from the standpoint of interrelated mechanical and chemical processes going on inside of it, and has reached its present state of development by very gradual and conservative steps over a long period. It may therefore not present the most favorable unit on which to commence with the regular use of enriched air for standard and continuous operations.

In fact, if we ever come to use highly enriched air in making ordinary pig iron, the resulting furnace is apt to have very little resemblance to the blast furnace of to-day. Our experience in the meantime with electric furnaces should help greatly in this evolution, as the conditions to be fulfilled in an enriched air furnace may reasonably be expected to lie between those of the electric and the present blast furnace.

As the blast furnace, however, is the piece of equipment requiring the most continuous and uninterrupted operation, it may be that the enrichment of air for it as an emergency measure in case of trouble, such as a threatened freeze-up, may prove of considerable importance; not that freeze-ups really happen with the frequency which one would assume from their prominence in text books and discussions, but that this very infrequency may mean that blast furnace operators have come to work with so safe a margin of conditions to avoid them that this insurance is costing daily in coke consumption and other requirements or results very much more than we realize, and if one could have a stand-by source of oxygen for enrichment purposes in case of emergency, even though it were not used at all in normal operations, it might permit of safely running on a very much closer margin in the heat allowance of the furnace and making important improvements in its general economy and efficiency.

Another important effect of the enrichment of the air would be the higher calorific value of the blast furnace gas obtained as a by-product, due to elimination of part of its nitrogen. This in turn should mean cheapening of gas engine and other equipment on which it may be used.

Application to the Open-Hearth Furnace

The open-hearth presents some of the most interesting possibilities for the application of oxygen, particularly in those operations where the electric furnace has been the open-hearth's strongest competitor, for example, where very high temperatures, coupled with a reducing atmosphere, are desired, as in the elimination of sulphur as calcium sulphide. With an open-hearth using ordinary air, in order to reach the highest temperatures now attainable, a complete and carefully balanced combustion of the gases must be secured, resulting in a neutral or slightly oxidizing atmosphere,

whereas if part at least of the furnace's burden of inert nitrogen could be removed by the use of enriched air the same temperature could be reached while still leaving a residue of unburnt material in the gas, thus producing a strongly reducing atmosphere.

By enriching the air the total volume of gases passing through the furnace per unit of fuel burned and heat produced may be cut down enormously, since in the air there are four volumes of inert nitrogen to every volume of useful oxygen. This would greatly facilitate heat exchange and reduce mechanical difficulties, such as dust losses, maintenance and control of draft, and the like.

Use in Producers and the Converter

If we carry the application of oxygen back of the open-hearth to the gas producer we may still further extend the same principles and deliver to the furnace more thermal units per unit of primary fuel consumed. Besides the actual saving of fuel which this represents, it may in some instances be still more important in cutting down the amount of impurities, especially sulphur, carried into the metal from the fuel. Aside from both of these considerations, and viewing the gas producer simply as an isolated unit in connection with either heating or power operations, oxygen enrichment of its air supply will permit the use of fuels which could not otherwise be burned in it at all, and thus vastly increase our available fuel resources.

In the matter of possible application to the converter it is perhaps hazardous to speculate in advance of actual experimentation, but once an adequate supply of oxygen is available in the steel works such experimentation will almost inevitably produce useful results, some perhaps from directions we least expect. One of the conditions limiting what metal may go to the converter is the fuel value of the metalloids it contains, and in many cases we are paying rather heavily through operating conditions of the blast furnace to put silicon into iron largely for its fuel value later in the converter. A good part of these heat requirements might be removed by abstracting part of the dead load of inert nitrogen from the converter air.

Whether such a procedure might lead to a change in our practical classification of Bessemer ores is an interesting question, but there seems to be so much difference of opinion at present and so many factors enter into the problem that all that can here be done is to merely mention the problem as suggestive of the wide and intensely interesting field of possibilities which cheap oxygen will open up.

The interest of this institute naturally centers in iron and steel, but in closing it may be useful to point out how equally important and possibly even more diversified are the applications for cheap oxygen in the nonferrous field and that consequently you may feel certain of the active interest and co-operation of your fellow metallurgists from that side in the working out of the many fundamental problems of common interest underlying the general subject.

Discussion by C. A. Meissner

Dr. F. G. Cottrell, in his very interesting paper on the enrichment of air with oxygen, has brought to a focus a subject upon which there has been much discussion and speculation for a great many years past.

Experiments in Belgium

The hope has been frequently expressed in technical literature that a material saving in coke consumption and an increased pig-iron production could be obtained by the use of additional oxygen in the air. Some experiments have also been made in order to ascertain the effect of increased oxygen in air in blast-furnace practice notably at Ougrèe, Belgium, where Dr. Peters built a small blast furnace and operated it for several years with oxygen obtained by the Claude process, and then for several months just before the World War, began on air enrichment to about 10 per cent by means of centrifugal methods invented and perfected by Professor Mazza of Italy.

Few, if any, of the results have been published, and this seems to be the only really serious effort that has been made in this direction. Such results from Ougree as have come under notice have indicated that under their rather crude method of making pig iron with rather high coke consumption and low blast temperatures they obtained about 10 per cent reduction in coke consumption and about 10 per cent increase in pig-iron production, and that this centrifugal method had had a further effect of reducing the moisture when conditions of high humidity obtained in the air, and giving a more even amount of moisture to the blast furnace, avoiding the peaks.

Some further experiments have been made by the late J. E. Johnson, Jr., at Niagara, of which little seems to be definitely known, and I am not aware of any records left by him as to his results.

Conclusions of the Steel Corporation

This subject has repeatedly been under discussion by the members of the blast-furnace committee of the United States Steel Corporation and our general conclusions as to the effect of oxygenating the air for blast furnace use are given herewith. These conclusions are naturally based on theory, as we have had no practice to go by.

Ten per cent additional oxygen in the air has usually been accepted as being most likely to show what benefits could be derived by oxygenating the air. The knowledge that we have of Johnson's experiments would indicate that if 20, 30 or 40 per cent oxygen enrichment were employed, the form of the blast furnace as well as its total equipment would have to be entirely changed. The question, therefore, is what will 10 per cent enrichment do in our present equipment in blast-furnace practice. Most of our modern blast furnaces built on best lines, with large hearths, steep angles and wide boshes, and equipped with ample stove capacity, will have a top temperature of the escaping gases of from 300 to 450 deg. Fahr. Many of the Minette furnaces in the Lorraine and Luxemburg districts of Europe will have a top temperature of about 215 to 300 deg. Fahr.

To materially lower this top temperature would apparently cause very serious disadvantages in practice. It might even lead to a wet top, that is, condensation of moisture from the gases at the top of the furnace. The only real saving that the use of oxygen could effect would be to still lower this top temperature by higher concentration of heat in the combustion zone and in the hearth, and under modern conditions it is doubtful whether this saving will be appreciable in practice under the above conditions.

There is no question that a higher temperature of combustion will be obtained in the hearth of a blast furnace by burning the coke with oxygenated air, but it is a well-known fact that the temperature existing in the blast-furnace hearth is almost exclusively governed by the heat balance depending on the heat-producing and heat-consuming reactions. This temperature should not be permitted to vary but little in order not to cause changes in the quality of the pig iron, as therefore the hearth temperature remains the same while the amount of heat carried off by the gases leaving the hearth per unit of coke carbon burned is less in proportion to the smaller amount of nitrogen in the blast there should be more heat remaining available for the hearth reactions and, as there has been no greater heat demand created per unit of product, a decreased coke consumption should result. This, however, means a decrease in the amount of gases produced as compared with the former operation and, therefore, a lower top temperature would inevitably result and as this lowering of the top temperature might seriously affect the operation of the furnace, it would soon become necessary again to increase the coke consumption until the lowering of the top temperature has passed the danger point.

Therefore, we can hardly expect to add any material coke saving through the enrichment of the air with oxygen under such conditions.

Where, however, we have furnaces operated with high top temperatures, such as those producing ferromanganese, ferrosilicon, or those working with rich

ores, or having high top temperatures on account of poor construction and equipment, or other conditions, a certain definite gain can undoubtedly be expected. Just what this gain will be no one as yet can tell, nor to what extent we can enrich the air beyond 10 per cent in such cases. There could be no doubt as to the value of enriching air with oxygen for blast furnaces in an emergency, due to hanging or slipping or becoming cold or for any other reason, but then we have to consider the question of installation of such a plant as would give us cheap oxygen and it might not be easy to arrange a plant for intermittent operation. There is, therefore, a big field for investigation on this subject still open to us.

New Steel Sash Enterprise at Chester

Allison Steel Products Co. to Manufacture, with Improvements, a Type of Sash Long in Favor Abroad—Also Steel Partitions, Doors, etc.

BRIEF references have been made heretofore in THE IRON AGE to the establishment at Chester, Pa., of the Allison Steel Products Co., a corporation which will specialize in the manufacture of steel sash and operating systems, steel partitions, steel doors and counterbalanced sash, all of which embody ideas new to such construction and which are patented. A notable feature of the plant in which the various products are made is that its first unit is itself constructed of the new sash and serves as a model of what the company can supply. Another feature is that the system is a refinement of one long in use abroad where metal sash had its inception. Where used in monitor construction in Europe it was known as "northlight sash."

Arrangements for manufacture in this country were perfected in England by T. A. Allison, senior partner of Allison & Co., Chester, who went abroad for the purpose last winter. In addition to acquiring the manufacturing rights, Mr. Allison engaged experts who had been intimately associated with what is perhaps the best known foreign system of steel sash and operating devices, a notable example of which exists in the plant of the Crittall Mfg. Co., Braintree, Essex, England, a company acknowledged to be a pioneer and leader in the design and manufacture of steel sash and allied products. The value of steel sash is no longer questioned as a means of securing proper ventilation, day-long natural illumination, permanence, economy of upkeep, fire protection and the best possible environment for workers. The special problems to be accomplished in the interests of the user are these:

To be weatherproof when open, thus giving ventilation at all times regardless of weather conditions.

To afford the greatest ventilating area to light area.

To facilitate the removal of heated air instead of impeding it.

Overcoming the problem of condensation. In regard to this last, cases have been known where conditions have been so serious as to create the impression that the sash was leaking. In the Allison system a means is provided whereby water is conducted outside the building.

In the Allison fabricated steel sash, the sections consist of solid rolled-steel bars interlocked by means of patented joints designed to afford the maximum resistance to shock, vibration, wind pressure and wind suction.

The joints are so constructed that there is a minimum sacrifice of steel and likewise a minimum distortion of the metal. The method of joining, together with a cove shape found in the sections, is claimed to have many advantages, among them being a straight-line sash and the elimination of projections and square corners which tend to collect water and invite corrosion. The ventilators are double-weathered throughout.

The muntin bars are continuous from jamb to jamb and from head to sill. The joint is produced without bending either horizontal or vertical muntins, thereby eliminating fractures. It is interlocked to produce a rigid sash. The vertical muntin is a solid one-piece section, while the horizontal bar is composed of two

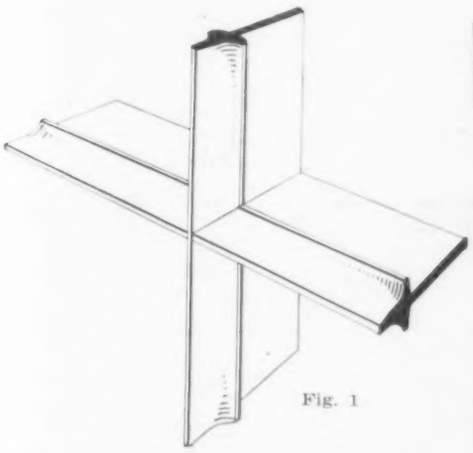


Fig. 1

Fig. 1.—Intersection of Horizontal and Vertical Muntins as It Appears After Assembly

Fig. 2

Fig. 2.—Sectional View Showing Assembly of Steel Sash to Be Made at Chester, Pa.

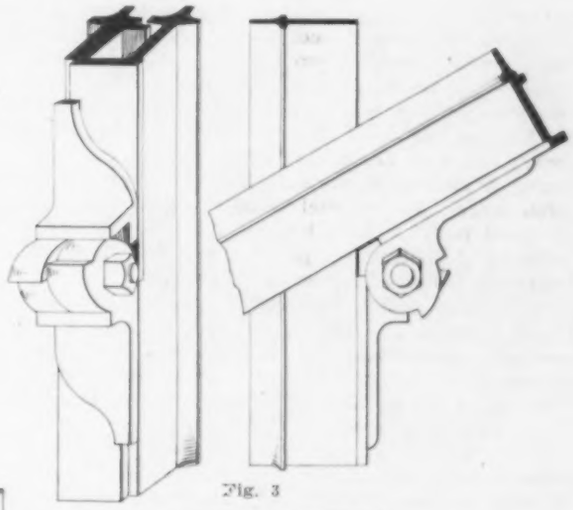


Fig. 3

Fig. 3.—View of Hinge Which Supports Ventilator. The hinge is of novel construction

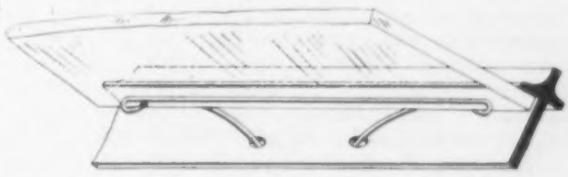


Fig. 4

Fig. 4—Wire Clip Which Holds the Glass in Position. Each clip has a 4-in. bearing on the glass

Sash in Power House of Crittall Mfg. Co., Braintree, Essex, England. It will be noted that the ventilators are opened to 90 deg.

sections passed through a hole punched in the vertical bar and is interlocked on the face to prevent side-slip. The ends of horizontal bars also are passed solidly through the side rails, strengthening the sash and thereby preventing racking.

Fig. 1 illustrates the appearance of a joint after assembly. In Fig. 2 are shown various sections used in the construction of the assembled complete sash.

The hinge used in connection with the ventilator is constructed of malleable iron and has no parts projecting into the dead air space at the sides of the ventilator to retard the free escape of condensation. The hinge has one leg riveted solidly through the vertical sash bar and the weathering and the other is riveted through the weathering itself, thus making possible a straight, flat surface contact between the upper and lower side weathering of the ventilators. A baffle strip is riveted to the upper side weathering and laps down over the lower side weathering, assuring weather-tightness at the hinge.

The pivotal portion of the hinge is composed of two cylindrical chambers, one on each half of the hinge. The end walls of the chambers are provided with ⅜-in. diameter holes located centrally, the holes being smaller than the inside diameter of the chambers. In assembling the hinges, two 3/16-in. thick washers having a 5/16-in. hole punched 1/16-in. off center are inserted, one into each chamber. The remaining space is filled with grease. The ventilators are then placed in position and the holes in the washers are brought into line and a rivet or bolt is passed through and secured in position. This construction makes the hinge and ventilator self-adjusting and allows the weight of the ventilator to ride on the washers, thus taking a large amount of the strain off the bolt or rivet. Stops are cast on the hinges to prevent the ventilator from swinging over the 90-deg. center. The hinge is illustrated in Fig. 3.

The company makes the following recommendations for side-wall steel sash:

"Any individual unit of sash should not exceed 70 sq. ft. when stationary; 55 sq. ft. when sash have 33 per cent ventilation and 40 sq. ft. for units having 66 per cent ventilation.

"These limitations are for glass 14 x 20 in. and may be increased 15 per cent for 10 x 16-in. glass, and should be decreased 15 per cent for 16 x 22-in. glass.

"While ventilators are made in excess of four lights wide and three lights high, we strongly recommend that before exceeding these limits consultation be had.

"It is important to remember that operating stays for steel sash are limited in length by reason of the fact that when closed the stay lies along the bottom weathering of the ventilator, and cannot project beyond the jamb of the sash. The stay must also be short enough that it does not project into the room so far, when the ventilator is partly open, that it becomes a source of danger to occupants of the building or limits the use of floor space immediately in front of the window.

"The maximum ventilator opening by reason of the limited length of stay is governed by the proportion of the height of the ventilator to the length of stay.

"We, therefore, recommend that all ventilators in the 16 to 18-in. glass heights be limited to three lights high and that ventilators of the 20 to 22-in. size be limited to two lights high.

"Where it is absolutely necessary to exceed the above limits in ventilators, we suggest that spring catch and chain operation be used."

The units of the continuous sash are connected by expansion covers to form an unbroken line and are hinged at the top and hung outside of all structural work, other than at the head. The latter is set behind and hinged to the vertical leg of a continuous angle which forms a weather-tight hood construction over the sash. At the sill, the vertical members of the sash rest against and extend below a continuous angle which is part of the steel structure of the building. The vertical members are so constructed that they support the glass which also extends below the continuous structural angle, thus effecting weathering at the sill and allowing condensation to run down, unimpeded between the glass surface and the bottom structural angle, thereby conducting all water from condensation outside the building.

The vertical members of the sash are tied together by heavy angles running the full length of each unit of sash. In addition to insuring rigidity these angles are used as a connection for the special operating device used for opening and closing continuous sash to which further reference will be made.

The glass is held in position by spring glazing clips which give a 4-in. bearing surface on the glass for each clip, the glass, in addition, being puttied on the inside with a special sash putty.

At each end, the sash laps a special storm panel which prevents rain or snow from blowing in at the ends of the sash when open. The storm panel is illustrated in Fig. 5. It is triangular in shape, is hinged at the side and a corner is connected to the operated sash by means of a sliding link. By means of this departure from the square, fixed type of storm panel, it is asserted that a positive weather protection is obtained, as the storm panel swings out with the operated sash. Snow and rain are prevented from blowing in, yet free circulation of air is not interfered with. The triangular construction permits the attaching of the sash rod of the operating device at the extreme end of the operated sash, thus overcoming sash sagging at the ends of the lines.

The panel is constructed of 1½ x 1½ x 3/16-in. material and welded at the corners, and is attached with hinges to a piece of specially constructed No. 12 gage channel, which is in turn riveted to the fixed

sash. The purpose of the channel is to conduct rain water, which strikes the storm panel, outside the building.

The company's preference is for solid riveted joints in sash, its experience having shown that the riveted method is stronger and more dependable than the welded, being more immune to injury from jar or vibration.

The 2½-in. leg of the top rail extends down. This, together with the bottom rail and the tied-in construction, insure the sash against sagging while in the vertical position. The 2½-in. leg of the bottom rail extends at right angles to the side walls and muntins, and provides rigidity against sagging while the sash is in the open position, as well as providing for attachment of the operating device. As there is no projection beyond the face of the glass, no drip holes are required for drainage. The expansion covers, reference to which has been made, which connect the units are made of 14-gage steel, formed to make a weathertight contact with the rail members. The function of the covers is to provide the necessary flexibility to prevent strain on the sash or glass, due to faulty alignment of structural work.

The sash is made in standard lengths for spacing on 20-ft. centers, allowing 1 in. for expansion. At the same time special units are made, so that the total length of each sash need not be a multiple of 20 ft. Vertical muntins are spaced on a 2-ft. center. As there are no horizontal muntins, the glass is always the full height of the sash.

The operating device is adaptable for use on all types of continuous and side-wall steel sash, both pivoted and top hung. The arms are made of malleable iron and are supplied in three sizes to meet the various loads and opening requirements for different heights of sash. The arms, in operation, give a compound motion, being pivoted at two points to provide as near a direct thrust on the sash as possible, and at the same time reduce the lateral motion and therefore side friction to a minimum.

Fig. 5.—Triangular Storm Panel at End of Sash. It operates in conjunction with ventilator and is designed to prevent rain and snow blowing in

The arms are operated by a plain worm and power gear in moderate-sized lines, the power being delivered to the arms by means of ½-in. steel rods in tension. The worm and gear power locks the sash in any position, and prevents the slamming of the sash when closing.

In extremely long lines, a compound progressive worm and gear power is used which, in conjunction with the compound arms, makes the use of counterweights usually unnecessary. With a constantly applied power on the hand chain the compound power delivers a constantly increasing power to the operating device, but does not increase the load on the hand chain.

Operating Mechanism (Upper) at End of Sash. Worm and gear transmit power from the hand chain to the rods

Continuous Sash (Lower) of the Type to Be Manufactured at Chester, Pa., by the Allison Steel Products Co. Well shown in the illustration are the tension rods and operating arms

On the sprocket chain of the operating device are attached stops to prevent strain on the line. The company also makes a winding gear which permits the operation of the sash with a removable crank handle.

The Allison steel partitions are of standard unit construction. The lower portion of the units are fitted with steel base plates and the upper portion is divided vertically into openings suitable for glass of reasonable sizes. The design of the mullions is determined by the height of the partition. Flat plate mullions are used in the low partitions and channel construction or a combination of the channel and plate mullions in the higher types. The doors are of tubular design and have a pressed metal frame of simple design.

In the manufacture of the partitions, bolts and nuts on the surface have been eliminated; edges are flush with the sections, no floor castings are used and hinges are enclosed and not fastened on the face of the doors.

The counterbalanced sash made by the company utilizes block wedges located on the corners of the sash

and on the jambs and mullions. The sash are constructed so that there is play in the runway for free movement in every position, except when the sash is locked.

In the closed position both the upper and lower sash are wedged over tight against the jamb, to insure weathering. The sash are equipped with lever handles to permit easy raising from the wedged position.

The plant of the Allison Steel Products Co. is located at Second and Palmer streets, Chester. The first building unit is 62 x 202 ft., the construction being of steel, brick and concrete. The personnel of the new company comprises the following:

President, T. W. Allison, senior partner of Allison & Co., chairman of the board of directors S. A. Ashman & Son Co., Philadelphia; vice-president, Edwin D. Glauser, Stacey G. Glauser Lumber Co., Chester; treasurer, John J. McClure, president Chester Contracting & Construction Co. and secretary, John R. Wiggins Construction Co., Philadelphia; secretary, Kingsley Montgomery, attorney, Chester. The general superintendent is William Roper, who has been identified with steel sash construction in Europe and America for 25 years. The chief engineer of the company is Henry H. Renton, who also has had both European and American experience.

Lewis Hoist for Furnace Doors

Development of a foolproof hydraulic system on raising and lowering heavy doors such as are used on open hearth and heating furnace work is announced by the Link-Belt Co., Chicago. Doors thus operated, it is explained, always go up to the proper position and always go down to the proper position, no matter what the weight.

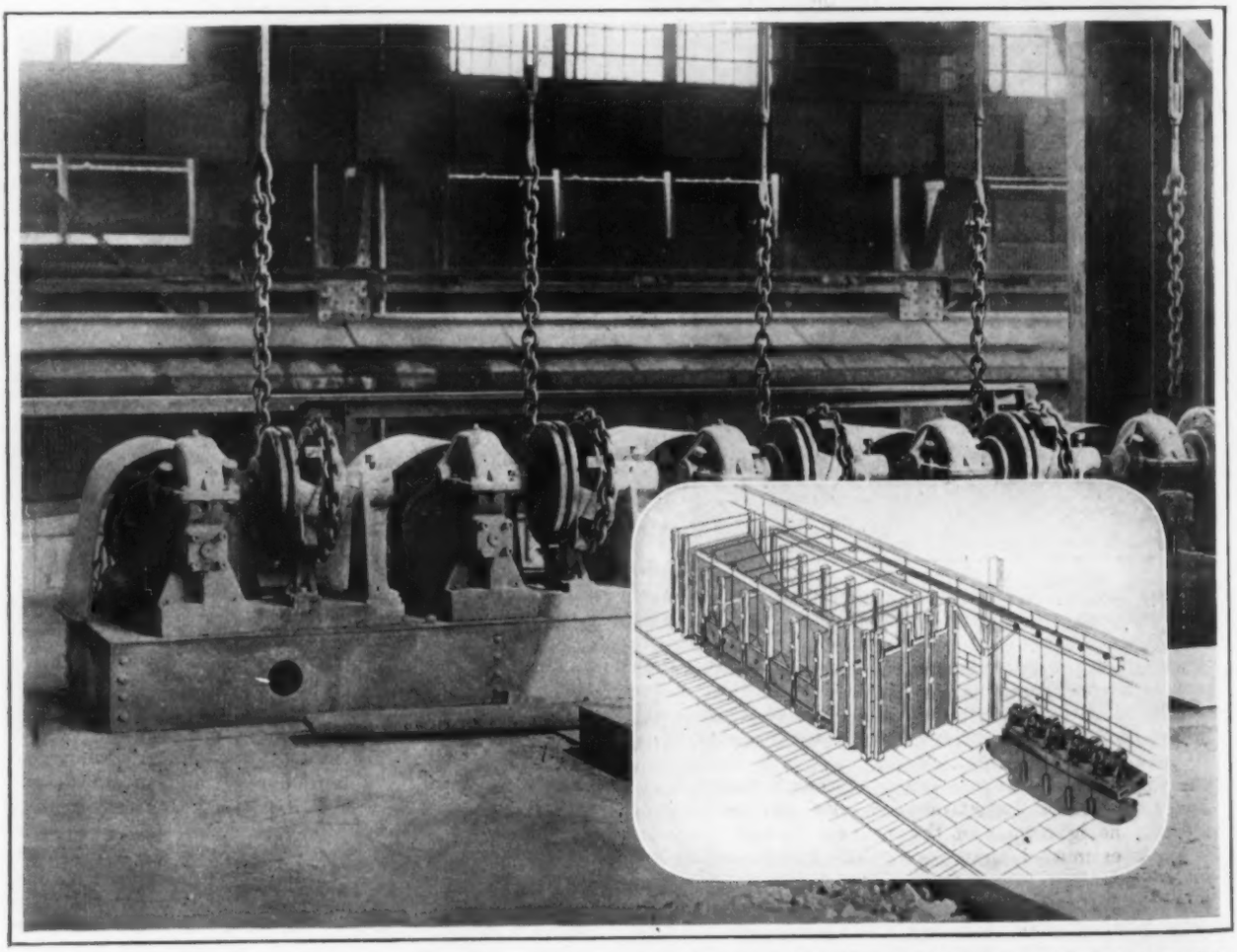
The first installation of this system, made at the plant of the Alan Wood Iron & Steel Co., Conshohocken, Pa., has been in continuous operation for 14 months. Five hoists, with an automatic release, are used. On each hoist is mounted a pair of chain sheaves attached to a worm wheel shaft between two flanges which are pinned to the shaft and supplied with fiber for friction surfaces on the sides toward the sheaves. The worm wheel is driven by a worm mounted on the shaft of a reversible motor, the worm and wheel being inclosed in a suitable housing.

To raise the furnace door, the motor is started in the direction which will pull down on the left hand chain.

As long as the counterweight continues its pull, the sheaves squeeze out against the flanges, and are thereby driven in the direction which will wind up the left hand chain, and thus lift the door.

The right hand sheave has a fixed stop on its periphery, so located that it will come in contact with a stop on the bottom casting when the furnace door has reached its proper height. With the motion of the right hand sheave arrested by this stop, the shaft cannot rotate the left hand sheave further, because the squeeze between the sheaves and friction flanges is relieved. There is no opportunity, therefore, for overwinding, and if through carelessness the current is not shut off promptly, the shaft with its flanges will simply continue to revolve in the sliding frictional contact with the sheaves, but without the power to grip and rotate them further.

For lowering the doors, the direction of the motor is reversed, and practically the same process repeated, except that in this case the power of the motor is used to lift the counterweight, while the pull from the weight of the door serves to keep the sheaves squeezed apart against the friction flanges, until a stop on the left hand sheave engages with a stop in the bottom casting, and prevents over-winding of the counterweight chain in the same manner as described for the other sheave.



Installation of Five Lewis Hoists. Stop features do away with automatic switch devices, the motor being started, stopped or reversed, and the furnace door raised or lowered, by a push button mechanism

Showing Men Dangers of Their Employment

Surprising Things About Accidents—Ignorance Due to Lack of Experience and Training, Improper Instruction and Failure to Understand

BY VAL KLAMMER*

AN accident without a human factor is as feasible as a steam engine without a piston or an electric motor without an armature. In every accident there must be a human factor with various physical factors, though the human factor may sometimes appear insignificant when compared with the physical factors. Analysis of any accident will reveal this human factor and show it in its true value. It will always be so, for accidents will continue as long as there is human life. As long as man is human and not divine, he cannot be infallible.

During the past few years great progress has been made in the war against accidents and a further decrease in the number of accidents is to be looked for in the future. Safety engineering and "Safety First" campaigns are responsible for this, but they have also produced another result. The human factor is becoming more important as the physical factors are reduced, or eliminated. When 80 to 90 per cent of the accidents in a plant are directly attributable to human failings and weaknesses, the safety engineer may justly conclude that real progress is being made.

Various Causes for Accidents

Accidents cannot be considered with the same attitude that Topsy had toward the origin of her existence when she declared that she "just growed." An accident never "just happens"; it is a direct effect of a cause, or of many causes. When there is more than one cause—as there generally is—there will be a primary cause with contributing causes. By itself the primary cause may not cause an accident, but, without it the contributing causes will fail to inflict human injuries. The problem for the safety engineer lies in locating the primary cause; the contributing causes are apparent.

The statement is frequently made that approximately 70 per cent of industrial accidents is due to carelessness on the part of the injured person. The truth of the matter is that only a comparatively small percentage of accidents is actually due to carelessness, while a much greater percentage is attributable to mind-wandering, clumsiness, ignorance and other human deficiencies. Investigation will show that, as far as the human factor is concerned, ignorance is one of the chief causes of accidents.

Lack of Statistics

The writer realizes at this point that he should, according to all literary precepts, now triumphantly produce statistics of ignorance as a cause of accidents, but is reluctantly forced to admit that, as the rube said of the giraffe: "Thar ain't no sech animal." It is true that we have available a few statistics of personal ignorance as a cause of injury, but that does not meet with the requirements of the case. The ignorance which causes an accident is not necessarily the ignorance of the injured man; it may be the ignorance of his fellow worker, his foreman, his employer, the machine designer, the builder or of other men who have any connection with the physical conditions involved in the accident.

Dr. George M. Price has said that ignorance is a prolific cause of industrial accidents, but he only refers to the ignorance of the worker. Another authority has estimated that out of 525 fatalities in Allegheny County no less than 132 were due to ignorance.

It is doubtful whether there will ever be any really satisfactory statistics of ignorance as a cause of accidents. The apparent causes are readily recognized and classified, but when the investigator has to discover an unknown and hidden cause he may easily lose himself in a maze of possibilities. If a man is killed through his own fault, we may quickly determine the physical causes of the accident, but no one can definitely state whether ignorance, clumsiness, chance-taking or mind-wandering is responsible for the action which costs the man his life.

Experience is the greatest teacher in the world and it is only through study of the accident experiences of other men that the safety engineer can fully develop his ability to discern danger. Any man of normal intelligence may be influenced by experience, whether acquired personally or from others, but the surprising thing is that men rarely consider for themselves the possibility of danger. It is common for men to work many years on a job quite unconscious of some dangerous feature in the occupation. The writer has often been told by machinists that they did not think there was any danger in sitting on a metal planer table as they had been doing it for many years without injury, while, as they talked, their legs were hanging in dangerous proximity to the stop dog and reversing latch.

A Difference in Opinion

In marked contrast to the claim that approximately 70 per cent of accidents is due to personal deficiency—which is more correct than "carelessness"—we have the opinion of Lucian W. Chaney of the United States Bureau of Labor Statistics that 60 to 65 per cent of industrial accidents could be prevented by proper engineering measures, whether improvements in manufacturing methods or materials. These rival claims may appear contradictory, but they are both within the bounds of possibility. An accident may be due to human weakness and yet preventable by engineering measures. When an accident shows that engineering revision can prevent a repetition, something is learned which was not known before; if there was no ignorance there would be no need for engineering revision.

Mechanical failure may be due to wear, inferior quality of material and workmanship, bad design, unexpected stresses, or numerous other causes; accidents happen when men are ignorant of the existence of these important factors. Bad design may be attributed to the designer, and he alone can be held responsible; it may be the result of carelessness, but the probability is that it will be really due to ignorance of the working conditions. In the design of any part the designer makes a liberal allowance for known stresses by using a big factor of safety, but there may be unknown stresses for which he must make allowance by using a factor of ignorance.

Causes of Ignorance

The causes of industrial ignorance are many, but they may be roughly classified as

(a) Lack of experience and technical training.

(b) Improper instruction.

(c) Failure to understand the instruction given, through difference in language or inattention.

The inexperienced man is the greatest accident hazard in a plant, but this risk decreases as he learns more about his work and the dangers connected with it. The majority of industrial accidents occur among men who are between 20 and 30 years of age, while the length of service of a large percentage of injured men is less than six months. United States Department of Labor statistics also show that the accident

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frequency among the non-English speaking foreign born is considerably greater than among the American born or the English-speaking foreign born. Teaching English to an alien is therefore not only good Americanism but also practical safety.

Employees must be educated in the dangers of their occupation and taught that there is a safe and an unsafe way of doing every job. The old employee, who is often a chance-taker, must be encouraged to look for further hazards. The new employee must be instructed by an instructor who is in every way familiar with the dangers of the job.

There is only one way to reduce accidents due to ignorance, and that is to reduce the ignorance. As the effects of an acid may be neutralized by the application of an alkali, so may ignorance be dispelled by education.

But the campaign against ignorance does not merely consist of educating other people; self-improvement is necessary. The employer cannot conscientiously expect his employees to practice "Safety First" unless he has its principles at heart, and aims at providing the safest working conditions possible.

The accident frequency of any plant is in inverse proportion to the amount of energy expended in accident prevention.

Pulverized Coal Versus Stokers for Boilers

Comparison of Equipment and Operating Costs— Factors to Be Considered in Converting Existing Plant

THE cost of equipment and operation of boiler plants using pulverized coal as compared with stokers, together with other data on the use of pulverized coal, was discussed by Fred A. Scheffler, Fuller Engineering Co., 50 Church Street, New York, in a paper, "Discussion of Pulverized Coal for Boilers," at a convention of the Association of Edison Illuminating Companies, New London, Conn. "Three and a half years ago," Mr. Scheffler said, "it was perfectly correct to state that pulverized coal was still in an experimental stage as applied to boiler furnaces; but since that time, although the war was responsible for the delay in advancing its progress, there have been a good many installations made, all of which are operating most satisfactorily. In plants where only one boiler was equipped for comparison with other methods of firing under the same operating conditions, the results were so far superior that all of the other boilers were changed over to pulverized coal.

Life of Brickwork Dependent on Gas Travel

"Three and a half years ago the only successful plant in operation consisted of eight 250-hp. boilers. In this plant the Fuller Engineering Co. first discovered the relation between the necessary furnace dimensions and the amount of coal fired per minute or second and the rate of speed at which the gasses travel across the brickwork, to which a reference is made further on in this discussion.

"To date, September, 1919, there are over 100 boilers in various parts of the United States and British Columbia operating night and day with pulverized coal, notwithstanding the setback in the development met with on account of the war.

"The large U. S. nitrate plant built during the war at Muscle Shoals, Ala., was equipped with the most complete pulverizing plant, the capacity being 384 tons of coal per day of 24 hours, as this was conceded to be the best and most satisfactory way to fire the large number of kilns used in the process work.

"It must be understood that complete combustion can be obtained with coal properly pulverized in a very small space and exceedingly high temperatures obtained, but such a small furnace would very shortly be damaged almost beyond repair as the brickwork would be destroyed. Consequently, in order to prevent such difficulty, the furnaces must be enlarged so that the ratio between the amount of coal to be burned per second and the rate at which the gases travel per second across the face of the brickwork will not exceed about 7 ft. per second. This rate of speed has been repeatedly verified in different installations, under our jurisdiction, with the result that in the oldest plant where the discovery was first made three and one half years ago (above referred to) the brickwork has not yet been repaired and is still in operating condition.

"The size of the necessary furnaces for certain ratings and overloads has been grossly exaggerated by numerous individuals who have apparently misunderstood the exact relation above referred to, and a great many people are consequently confused in regard to this matter. Many of the furnaces under boilers as designed to-day for stoker firing can be operated with perfect success, so far as their volume is concerned, with pulverized coal, as the requirements for either operation are more nearly approaching each other.

"To illustrate the above:

1.—A Stirling type of boiler for 800 hp. rated capacity with the mud drum raised up 8 ft. (11 ft. 6 in. from the center of the drum to the floor) will give a very excellent design for operating the boiler at 200 per cent of rating, continuously, without any extension furnace.

2.—A B. & W. cross drum type of boiler, 1400 hp. rated capacity, which had already been designed for double-ended stoker firing, the height of the setting being 32 ft. from the bottom of the front boiler headers to the basement floor under the boiler room floor, will make a very satisfactory furnace setting for 400 per cent of rating when fired with pulverized coal.

3.—The Stirling type "W" Detroit Edison boiler, 2400 rated boiler hp. unit, without any change in the setting at all as arranged for present double ended stoker firing, but utilizing part of the basement below the firing floor level, will give a very satisfactory furnace for 260 per cent of rating, continuously.

Pulverized Coal vs. Stokers

"Comparative costs between stoker and pulverized coal installations in, say, plants from 5000 hp. and upward, shows that it really will not cost any more for a pulverized coal equipment, including boiler equipment, feeders, conveyors, pulverizing plant, driers, building, etc., than is the case with a stoker equipment, taking into consideration all the items entering into the latter, such as the stokers themselves, necessary blowers for air supply and ducts for same, coal conveyors, crushers, bunkers, driving apparatus, etc. An illustration of what these costs would be, compared with that of pulverized coal cost of operation for both methods is submitted below.

"It will be noted that, including fixed charges of 15 per cent on both investments, the cost for stoker firing is $0.562 per net ton, based on using 276 tons per day of 24 hours, bituminous coal, and for pulverized coal firing the cost per net ton, including pulverization, is $0.525 based on 225 net tons of coal per 24 hours.

"It will also be noted that the difference in the quantity of coal required with stokers and that for pulverized coal is due to the lower over-all efficiency by the month or year with stoker firing, as compared with pulverized coal firing; the former being based on 65 per cent and the latter on 78 per cent. This difference of 13 per cent can be easily accounted for by the following items:

	Per Cent
Standby losses due to banking fires, changes in demand for steam, steam wasted through safety valves blowing off	5
Losses due to carbon contained in the ash (This might run to 3 per cent with high ash coal)	1½
Gain due to better combustion with pulverized coal (This item may run to 10 or 15 per cent with certain grades of coal)	6½
Total	13

Cost of Equipment and Operation of Boiler Plant, Pulverized Coal as Compared with Stokers, based on 200 Per Cent of Rating

5-1000 B.hp. at 200 per cent of rating = 10,000 Max. B.hp.
Average load for 24 hr., 6000 hp.

Stoker plant, including stokers, blowers, ducts, conveyors, crushers, bunkers, drive, etc., will cost about	$150,000.00
Fixed charges at 15 per cent per annum	22,500.00
For 360 working days, per day = 22,500 ÷ 360 =	62.50
Coal. Bituminous of 13,500 B.t.u. per lb. Costs at plant	$4.25
At 65 per cent boiler and furnace efficiency, 6000 B.hp. requires 276 tons in 24 hr.	
Cost of coal per day, 276 × 4.25 =	$1,176.00
Power for coal handling, 30 kw. × 24 hr. = 720 kw.-hr. × ½c. =	$3.60
Power for driving stokers 1 per cent × 6000 × 34.5 × 24 × ½c. =	20.12
Power for driving fans 2 per cent × 6000 × 34.5 / 12.3 × 24 × ½c. =	40.24
Labor for coal handling, 1 man, 3 shifts 40c. hr. × 24 =	9.50
Repairs for stokers at $1 per rated B.hp. per yr. $5,000 ÷ 360	13.90
Repairs for coal handling equipment =	5.00
Total operating cost per 24 hr.	$92.46
Coal preparation cost per ton fired, 92.46 ÷ 276 = 33½c. =	$0.335
Plus fixed charges per net ton of 22.65c. and 33.5c. =	0.562
Total cost of plant operation per day, 24 hr., exclusive of boiler room labor =	$1,330.96
Pulverized bituminous coal plant including 442-in. Fuller Lehigh pulverizer mills, conveyors, bins, drier, building, blowers, feeders, burners for boilers, etc. Cost	$127,173.00
Fixed charges, 15 per cent × $127,173 ÷ 360 days	52.90
Coal, bituminous 13,500 B.t.u. at 78 per cent comb. eff. 225 tons per 24 hr.	$956.50
Power at 16 kw.-hr. per net ton × 225 × ½c. = 18 per 24 hr.	$18.00
Labor, 51 hr. per day at 40c.	20.40
Fuel for drier 2.75 tons at $4.25	11.70
Repairs for pulverizer plant, 7c. per ton × 225	15.75
Total operating cost per 24 hr.	$65.85
Coal preparation cost per ton fired, 65.85 ÷ 225 =	.29
Plus fixed charges per net ton of 23.5c. and 29c.	0.525
Total cost of plant operation per 24 hr., exclusive of boiler room labor	$1,074.25
Saving by pulverized bituminous coal per day	$256.71
Annual saving 360 days at 256.71 = 72 per cent or more on investment =	$92,400.00

(My assumption of 65 per cent for the overall boiler and furnace efficiency with stokers, with a good grade of coal, has been criticised by one or two prominent engineers, in connection with the operation of large power plants with excellent care and maintenance and with boilers which have the very best possible design of furnace for stoker firing. These gentlemen say they have obtained 72 to 73 per cent boiler and furnace efficiency by the year. While I do not dispute such a statement and the fact that there are a few plants in this country operating under such excellent conditions, where the load factor is unusually good, at the same time other prominent engineers have confirmed the assumption that the estimate of 65 per cent is very fair and unquestionably the majority of the plants in the country are not obtaining by the month or year any better efficiency than this figure.)

"The above costs for pulverizing coal are actual costs taken as an average over several years' operation in plants where pulverized coal is used in amounts of fairly good tonnage of 100 to 200 tons per day of 24 hours. One of these plants burned 36,682 tons per annum and the cost, including labor, operating material, repairs to all machinery, power for operating the mill, conveyors, etc., and delivering the coal to the point at which it is to be fired, amounted to $0.3148 per ton.

"Another plant burning 63,016 tons per annum amounted to $0.2733 per ton.

"In order to show the great variety of coals which can be burned with the same pulverizing equipment and same boiler and furnace, I would mention the plant of the M., K. & T. Railroad at Parsons, Kan., where at different times McAlester, Okla., coal was burned containing 12,630 B.t.u., also Cherokee slack of 11,560 B.t.u., semi-anthracite Kansas of 12,587 B.t.u., and Texas lignites of 8854 B.t.u.

"At the plant of the Susquehanna Collieries Co., Lykens, Pa., anthracite culm has been burned containing ash up to 40 per cent without difficulty, and the boilers have been operated at 150 to 200 per cent of rating, with efficiency of from 78 to over 80 per cent continuously."

The efficiency obtained per pound of combustible, the speaker said, would be "practically the same with inferior fuels as with good fuels, providing the coal is properly prepared, that is, dried and pulverized. This statement covers fuel ranging in B.t.u. value, say, from 8500 up to 14,000 or 15,000. Only the combustible burns, and unless the percentage of ash is excessive it will not interfere with combustion conditions. More coal will naturally have to be used if inferior in quality."

The latter portion of the paper was devoted to answers to questions which Mr. Scheffler stated had been raised from time to time, and was in part as follows:

Slag Formation and Removal

"Slag," Mr. Scheffler said, "does not form on tubes from coal burned in pulverized form, providing furnace capacities are not exceeded. We have no record thus far of any slag forming on the tubes of the boilers with pulverized coal in installations made by us. The large combustion chamber prevents this condition from developing.

"Furnace slag when it develops can be readily removed by having the furnace arranged with a hopper bottom so that the slag can run down and accumulate at a point accessible for removal. A removable slag car can be located under the hopper or a continuously moving hearth similar to a chain grate stoker can be installed. Only coals having an ash of low melting point will slag seriously.

"Where there is sufficient room and a suitable hopper can be installed, we have not found it necessary thus far to put in a mechanical means for removing the slag. This may be a development required in central power stations.

"A boiler operated 24 hours a day using 12,000 lb. of inferior bituminous coal per hr. containing 10 per cent ash and with combustion chamber properly designed to suit the operating conditions would only have to be cleaned out approximately once in eight hours. In other words, it is only necessary to clean these furnaces when the accumulation of ash or slag in the furnace becomes sufficiently great enough to increase the velocities of the gases of combustion and to prevent building up in the furnace.

"We estimate that the percentage of dust or ash passing out of the stack equals about 30 per cent to 50 per cent of the total ash of the coal. The balance is recovered in the combustion chamber and between the second and third passes back of the bridge wall and in the flue connection and stack base. Any objectionable amount can be recovered by dust collectors.

"When the installation is in a locality where the dust nuisance would be objectionably large, settling chambers can be provided between the boilers and the stacks. Dust collectors either of the centrifugal or water sprayed type could be installed to materially reduce the percentage of dust going out of the stack. With a proper installation and necessary precautions taken the operation should be dustless. The majority of the dust going out of the stack is so fine that it does not descend at all."

As to the necessity of blowing off the tubes more frequently with pulverized coal than with underfeed stokers, Mr. Scheffler said that with certain types of boilers, where the tubes are vertical or almost vertical, no more frequent blowing is necessary. Other types of boilers may require more frequent blowing, but present day practice of installing soot blowers simplifies such operation.

Installing Pulverized System in Existing Plant

The size of plant in which it would be advisable to adopt pulverized coal when the boilers are hand fired or stoker fired, the speaker said, will depend upon the local conditions, quality of fuel available and the characteristics of operation. "No fixed rule or definite statement can be made regarding the size of the plant which could profitably adopt pulverized coal. We do not believe, generally speaking, that plants using under 100 tons of coal daily could show a sufficient saving to warrant the investment.

"On the other hand, the small investment which

would be required for boilers alone in cement mills, steel plants and copper smelters, where they already have a pulverizing coal plant, would certainly warrant its use on any size boiler plant."

High Temperatures Carried Easily

High furnace temperatures, it was explained, can be carried easier with pulverized coal than with any other method of firing, providing the furnace is proportioned for the maximum rating at which the boilers are to operate. If a higher percentage of rating is required than obtained at present with stoker or pulverized coal, it would be necessary in every case to have the furnace proportioned for the percentage of rating desired.

"The cost of pulverizing," Mr. Scheffler said, "will naturally be an added charge to the cost of the fuel, but this item is counterbalanced by the repairs on stoker, the power required for operating fans for forced draft, and furthermore is counterbalanced by the practical elimination of standby losses such as banking of furnace during periods of low demand. The question of difference in the cost of operation will depend strictly upon the quantity of coal used, but in plants where pulverized coal is used the increased efficiency obtained will more than overcome the expense of a stoker installation.

"No more men will be required to handle the ashes from the pulverized coal operation than would be required for stokers. In fact, in a great many cases less men would be required.

"The number of men required for operating the boilers is dependent upon the size of the units and the characteristics of the operation. No more men are required in the boiler plant than are required by a stoker operation, and in a great many cases less men would be required."

Relative to what would happen if the pulverized coal should get on fire in the storage bins, Mr. Scheffler said that "if pulverized coal in the storage bins becomes ignited nothing would happen except coking may take place in the bins and it would be necessary to stop feeding pulverized coal into the storage bins or burn up as much of the pulverized coal in the bin as would run out or could be discharged to the boilers by means of the feed screw. The operation would have to stop and the bins cleaned out and the operation continued. There is no danger of explosion from smoldering coal in the storage bin."

Mechanical Overload Release

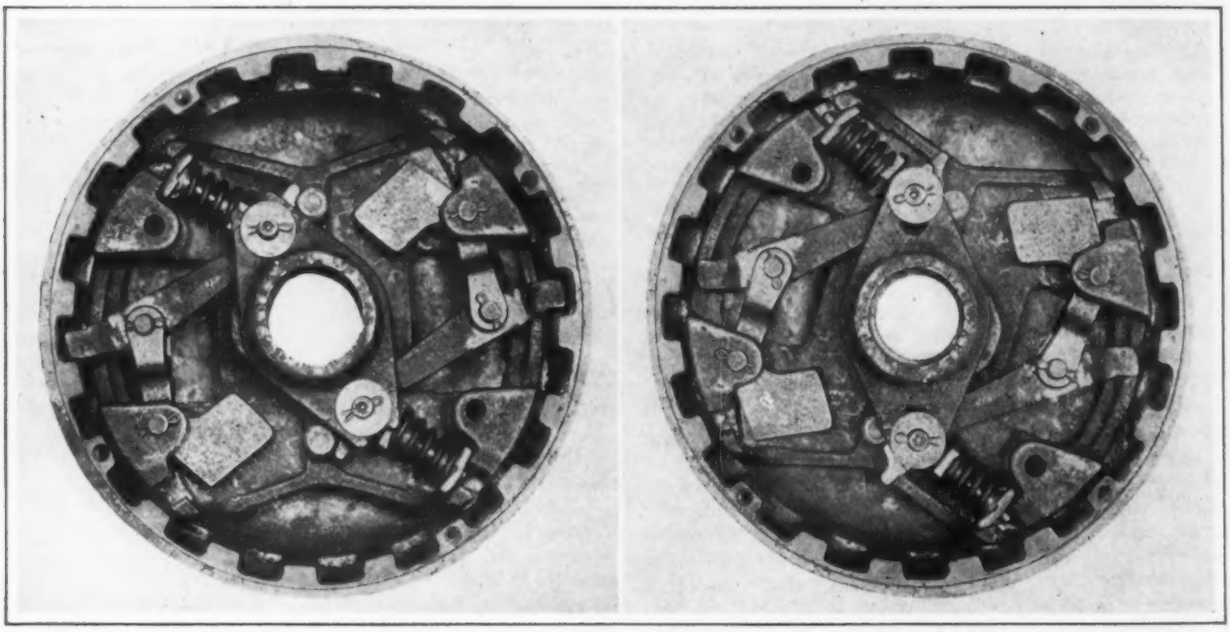
A mechanical device designed to disengage a drive instantly when the load exceeds a predetermined point has been developed by the Link-Belt Co., Chicago. It is known as the Lettgo mechanical overload release and is adaptable for elevating, conveying and power transmission machinery.

The release, it is explained, will automatically disengage the driving from the driven machinery if the load exceeds the fixed amount, thus allowing the driving motor or other source of power to run free and prevent damage due to the inertia of the motor armature or other high-speed moving parts, also it will release whether the load is gradually or suddenly applied, but it can be set so that it will not trip from jars or shocks.

The device is symmetrical and can be assembled to operate in either direction. It can be adjusted for tension, so that it will operate for any desired overload. The mechanism is entirely inclosed and can be packed with grease for lubrication purposes.

A spider keyed to the shaft has triggers pivotally mounted on links, with one end of each trigger engaging inside notches in the rim of the drum, and the other end in contact with a roller. Springs, regulated to any desired pressure by adjusting nuts, hold the ends of the triggers on the rollers under normal conditions, but when the drive is overstressed, the compression of the springs will permit the ends of the triggers to drop, releasing connection with the rim and allowing the driven machine to stop immediately.

To set the triggers again in the driving position, the collar is provided with fingers that engage the pins on the lower ends of the triggers. By turning the collar with a spanner wrench, the triggers are moved to the original position, and the outer ends at the same time enter notches in the drum, thus re-establishing the transmission connection. A cover fits the end of the drum and incloses and protects the entire mechanism. The hub of the drum may be extended to receive a wheel or gear, and have a bushing for running loose on the shaft; or may be keyed directly to a separate shaft, thus forming a coupling device, in which either element may be the driver.



The Lettgo Mechanical Overload Release with Parts in Position for Driving Is Shown in the Left-hand Illustration. The other view shows the parts in released position

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Construction work will be started at an early date on the new coke ovens to cost $3,000,000 for the Dominion Iron & Steel Corporation, Sydney, N. S. The Rust Engineering Co., Pittsburgh, has the contract for brick stacks to cost $70,000.

PRIORITY FOR COAL

Orders by Interstate Commerce Commission—Exports to Be Restricted

WASHINGTON, June 22.—Two important priority orders designed to relieve the coal situation have been issued by the Interstate Commerce Commission. The immediate occasion for them was the acute condition in New England, facts regarding which were laid before the commission by a delegation of State officials from that section.

One of the orders provides that railroads shall give preference to coal consigned to tidewater for shipment by coastwise vessels to New England. The other provides priorities for coal on all railroads east of the Mississippi.

The first order, known as Service Order No. 6, authorizes and directs the railroads, effective June 24, as follows: (a) To give preference and priority to carloads of coal consigned to James J. Storrow, Boston, as a part of a pool or pools of bituminous coal at any port for transshipment by water to any New England coastwise destination, or consigned as a part of a pool or pools of bituminous coal at any such port for transshipment by water to any United States coastwise destination other than New England; (b) and to furnish transportation of bituminous coal and cars therefor, consigned to any of said ports either for bunkerage or for cargo purposes, only upon a permit and direction therefor properly issued.

One effect of this latter order will be to restrict exports of coal. The order provides that permits shall be issued only upon a showing that the destination of the water movement of coal is a United States coastwise point, or if otherwise, that the preference and priority directed by the order will not be impeded thereby, and in any event that the shipper and consignee will be able to unload such coal at the port of transshipment without delay to the rail equipment.

Order for Open Top Cars

Another order, which is known as Service Order No. 7, was effective June 21. It directs carriers east of the Mississippi for a period of thirty consecutive days to furnish coal mines with open top cars suitable for the loading and transportation of coal in preference to any other use, supply, movement, distribution, exchange, interchange, or return of such coal cars.

The New England state officials besides conferring with members of the Interstate Commerce Commission met with members of the Shipping Board to urge the assignment of additional vessels for coastwise movement of coal. As a result of the request the Shipping Board arranged to allocate from 400,000 to 600,000 tons of shipping for the transportation of coal from Norfolk to New England.

The New Englanders have favored an embargo on exports of coal. Beyond the limited embargo imposed under the Interstate Commerce Commission's order, it is doubtful whether any further action along this line is in prospect. Efforts to bring about congressional action for an embargo failed during the final days of the recent session of Congress. While the President still retains his wartime powers over the control of exports and imports, it is not believed that he will exercise them in this instance. Coal operators have opposed an embargo, saying that it would destroy an export trade which will be of permanent value to the country.

Figures of bituminous coal exports compiled by the Department of Commerce reveal a decided increase in the outgo of this important commodity, comparing this year with last, but the movement does not differ to any important extent from that of 1913, as stated in THE IRON AGE last week. The April totals show that in April, 1920, the United States exported 2,431,639 tons, valued at $15,464,891, practically three times the exports of April, 1919, which aggregated 811,128 tons, worth $3,897,714. Most of this increase has been in recent months because in the 10 months ended April, 1920, the exportation was 17,443,251 tons, worth $90,250,627, as against 14,543,430 tons, worth $60,513,726 for the corresponding period last year.

The Department of Justice has issued instructions to district attorneys throughout the country to investigate charges of profiteering among bituminous coal operators. Attorney General Palmer in a notice to the district attorneys points out that, while he has received reports insisting that prices of coal at the mines now range from $7.00 to $11.00 a ton, and that a further increase is imminent, production cost figures gathered by the Federal Trade Commission show that costs of production have not exceeded an average of $2.79 per ton. The Attorney General stated that indictments should be returned wherever warranted. O. F. S.

Commission Sustains Railroad Company

WASHINGTON, June 22.—The Interstate Commerce Commission has again affirmed its rule that it will not grant reparation where the freight rates are claimed to have been unreasonable merely because a lower rate was applicable via another route of movement. This reaffirmation is the basis of a decision of the commission rejecting the complaint of Tuffli Brothers Pig Iron & Coke Co. against the Louisville & Nashville Railroad Co. because of $17.40 per ton charges collected on 90 tons of pig iron Aug. 21, 1916, from Birmingham, Ala., to St. Louis, and reconsigned to McGill, Nev. The complainant declared that the combination of rates based on St. Louis was unreasonable, because at the time these shipments moved, the other carriers originating pig iron at Birmingham for shipment west, participated in a joint through rate via St. Louis, and other gateways, of $11.20 to Cobre, Nev., from which point to McGill the rate is $3.92, making a through rate of $15.12, which would have been applied had the shipments originated at Birmingham on lines other than the Louisville & Nashville. About three months after these shipments moved, the Louisville & Nashville filed its concurrence in the tariff publishing the joint through rate to Cobre. The defendant railroad urged that, since the shipments were billed to St. Louis, it could do nothing other than receive them for transportation to that point and apply its legally published rate. It also declared that it did not participate in the joint through rate to Cobre because it deemed that rate too low, but later, when it appeared that its nonparticipation therein not only affected its pig iron traffic but other traffic as well, it was forced to meet competition and published its concurrence.

The Interstate Commerce Commission ruled in favor of the Seaboard By-Product Coke Co., of Seaboard, N. J., and the Thomas Iron Co., of Hellertown, Pa., to establish a rate of $1.40 per net ton on coke shipped from Seaboard to Hellertown. The Delaware, Lackawanna & Western, Central R. R. of New Jersey and Pennsylvania R. R. had collected a charge of $1.65. The basis of the ruling is the contention of the complainant companies that the rate to Hellertown from Seaboard, established on a basis of 25 cents above the rate from Hellertown to Bethlehem—$1.15 a ton.

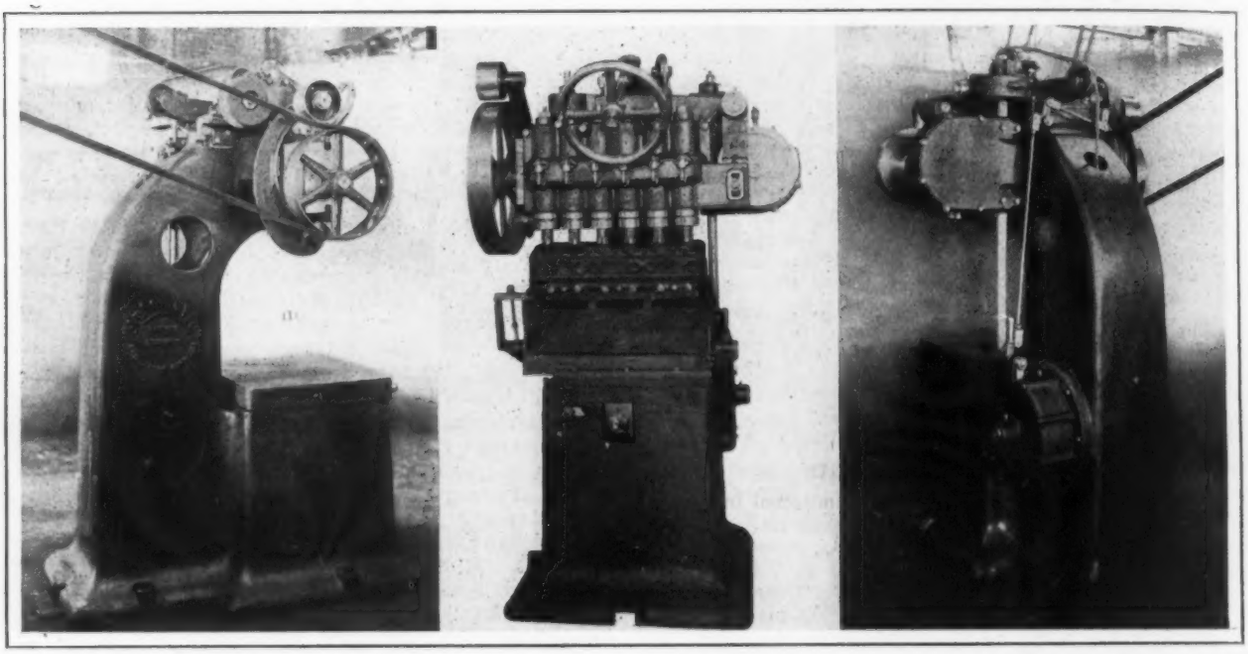
National Foreign Trade Floating Exposition

The First National Foreign Trade Floating Exposition will sail for South America and the Far East in October with exhibits on board of American manufacturers, the purpose being to improve trade relations with these countries and reduce the expenses incident to individual effort. Various lines of manufactures will be represented, though only one manufacturer from each competing field will have exhibits. The ship will tarry at each port from five days to two weeks. After those primarily interested are admitted to the ship, the general public will have access. Interpreters will be on board. A publicity man will precede the expedition. The trip will last eight months, and the following countries will be visited: Central and South America, New Zealand, British Straits Settlements, Australia, Philippine Islands, China and Japan. The exposition offices are at 50 Church Street, New York.

Multiple Spindle Profile Milling Machine

A machine known as the Coulter automatic multiple spindle profile milling machine designed essentially for quantity production has been recently brought out by the Automatic Machine Co., Bridgeport, Conn. It is particularly adaptable for profiling compression space on gas engine cylinders and cylinder heads, for spot facing these same parts or for facing exhaust, intake, or water manifolds. It is also adaptable for use in profiling other manufactured articles. When fitted with a transfer table, multiple parts can be continuously milled. It is so designed that when the cycle is performed, the feed is tripped out so that no special attention by skilled operators is necessary. When the feed stops, the cutters continue to revolve to clear themselves.

The mechanism is built to stand modern production speed. One cam governs the movement of the platen or table, while another cam moves the cross slide, or spindle head. These cams are so designed and synchronized as to produce the outline desired in cutter travel. Different cams are needed for different outlines, but there is an adjustment for wear in cutter diameters in profiling any single design.



Coulter Automatic Milling Machine Designed for Quantity Production. It is especially adaptable for profiling and spot facing compression space on gas engine cylinders and cylinder heads, for facing manifolds, etc.

The proportions of the spindles, with ample bearing surfaces, in accordance with the best milling spindle practice for heavy production work, is worthy of notice. There is an independent adjustment for depth on each spindle and suitable provision for proper lubrication. Each spindle is driven by a spiral gear at its center with adjustable taper bearings below and straight adjustable bearings above the driving point. The whole spindle head is counterweighted and is raised or lowered by the hand wheel in front and above the head. No adjustment between centers of the spindles is provided because it is essentially a production tool, but the spindle carrier can readily be removed and a new one substituted with the new dimensions, using the same spindles.

Motor drive arrangement is secured by attaching a bracket for the motor to the rear of the column near the base, giving a low center of gravity and putting the motor where it will not be in the way.

Already more space has been sold for the second annual exhibition of the American Steel Treaters' Society at Philadelphia, Sept. 14 to 18, than was disposed of for the exhibition at Chicago a year ago. The entire floor space is 80,000 sq. ft. and 50 exhibitors are booked to date. An excellent program of papers is in preparation.

New Fuel and Metals Company

The International Fuel & Iron Corporation, Pittsburgh, has been organized under the laws of Delaware, with a capital of $500,000, including preferred stock and 10,000 shares of common stock of no par value, and will take over on July 1 all the interests of the International Fuel Corporation and the Superba Coal & Coke Co., both of Pittsburgh, also the Industrial Coal & Coke Co., New York. The new company will handle pig iron, billets, sheet bars, forging billets, all kinds of alloys, coal and coke. Its main offices will be in the Frick Building, Pittsburgh, with branch offices in the Stock Exchange Building, Philadelphia, and at 47 West 34th Street, New York. W. B. Enck, formerly vice-president of the Donner Steel Co., Buffalo, who will have his headquarters in the Philadelphia office, will be in charge of sales of iron, steel and alloys. Charles R. Reese, formerly assistant city sales manager of the Carnegie Steel Co., will be assistant to Mr. Enck and will have his headquarters in the main offices, Frick Building, Pittsburgh. L. H. Kelly will have charge of sales of coal and coke in the Pittsburgh district, and will be located in the main offices in that city. C. W. Stone, formerly resident manager at Pittsburgh of the Walter-Wallingford Coal Co., will be in charge of sales of coal and coke, with offices in New York. The manager of sales of coal and coke for the Philadelphia district will be appointed later. C. W. Wilson, formerly of International Fuel Corporation, is president of the new company; H. K. Lyons, formerly of Industrial Coal & Coke Co., W. B. Enck, L. H. Kelly, and A. C. Stickel, formerly president of the Clever Gas Coal Co., are vice-presidents, and H. S. Lewis is secretary and treasurer.

Fabricated Steel Business in May

The total amount of fabricated steel work contracted for in May was 61½ per cent of the capacity of the bridge and structural shops of the country. This amounts to about 110,700 tons and represents a falling off of about 12,000 tons from April's volume of business, which was 122,500 tons. For the five months of this year the average has been 137,850 tons. The best month was February, with 171,000 tons.

The 500 70-ton steel hopper cars ordered by the Youngstown Sheet & Tube Co., Youngstown, Ohio, will be used for movement of coal from the company's mines at Nemacolin, Pa., to its plants and by-product coke ovens at Youngstown and East Youngstown. Daily coal consumption averages from 6000 to 7000 tons.

STRONG FOR OPEN SHOP

Third Annual Convention of Southern Metal Trades Association at Atlanta

ATLANTA, GA., June 21.—With the election of officers and the adoption of a number of resolutions, the third annual convention of the Southern Metal Trades Association closed Thursday after one of the most successful gatherings ever held.

President William T. Harding, Raleigh, N. C., was re-elected. Other officers elected were J. M. Moore of East Point, Ga., first vice-president; W. E. Dunn, Jr., Atlanta, secretary, and Charles Weglin, treasurer. The following were added to the executive committee: J. M. Moore, E. E. Reese and Horace Lanier.

New State vice-presidents elected were W. L. Wilson, South Carolina; Charles Weglin, Alabama; T. C. Keeling, Tennessee; R. W. Graves, Mississippi, and Charles R. Law, Texas.

The association declared for the open shop by unanimously adopting a resolution reaffirming its former position. Other resolutions adopted were to instruct each State vice-president to institute a vigorous membership campaign immediately, and to affiliate the association with the United States Chamber of Commerce.

The association through resolutions commended the Atlanta Builders' Exchange, the Presidents' Club of Atlanta, the Georgia Manufacturers' Association, the Employers' Association and the Open Shop associations of Charlotte and San Antonio and other like organizations, for their firm stand on the open shop question.

The concluding session was featured by an address on the "Production of Good Castings," by Dr. Richard Moldenke of Watchung, N. J.

Increased production to meet the increase in wages as a means of "taking water out of wages" and routing discontent throughout the country was recommended to the delegates at the first session of the convention Wednesday by J. F. Trazzare, manager of employment and public relations Georgia Railway & Power Co.

Mr. Trazzare laid emphasis upon the fallacy of politics in endeavoring to straighten out the industrial unrest of the country or the use of coercive measures by capital or labor, and urged a realization by both manufacturers and employees that the maximum production was necessary to end the national unrest.

The convention was called to order Wednesday morning by President Harding, after the delegates from nine southern States had joined in singing "America." The address of welcome was delivered on behalf of the city by Eugene R. Black, president of the Atlanta Chamber of Commerce, and the response was made by Charles R. Law, president of the DeSota Foundry & Machinery Co., Mansfield, La. The remainder of the Wednesday morning session was consumed with the reading of the secretary's report, the annual address of the president and an informal discussion of various topics relating to the iron and steel industry.

The entire delegation was taken in automobiles at 1.30 o'clock Wednesday afternoon to Lakewood park, where an old-fashioned Georgia barbecue was attended. This was followed by a sight-seeing automobile tour over the city and to nearby points of interests, including the neighboring Army camps. Another enjoyable social feature of the convention was a theater party on Thursday night.

Higher Wages and More Employees in Iron and Steel Plants

WASHINGTON, June 22.—The iron and steel industry showed an increase in employees and payroll totals for March, 1920, over March, 1919, according to the figures of the Department of Labor. The textile industries in the same month, however, showed far larger increases.

In 111 iron and steel establishments, these statistics show an increase of the employees from 160,467 in March, 1919, to 170,963 in March, 1920, or 6.5 per cent. The semi-monthly payroll total rose from $10,525,648 in March, 1919, to $13,206,450 in March, 1920, or 25.5 per cent. In 107 of these establishments, the number of employees rose from 163,810 in February, 1920, to 166,732 in March, 1920, or 1.8 per cent, while the semi-monthly payroll rose from $12,075,932 to $12,887,959, or 6.7 per cent.

With specific reference to the iron and steel plants involved, the departmental report says:

"One plant reported increases ranging from 10 to 40 per cent, affecting 72.6 per cent of the employees. Six establishments granted an increase of 10 per cent, which affected all of the employees in four of the plants, 34 per cent of the force in the fifth mill, while the sixth firm did not state the number of employees affected. Four establishments granted the common labor an increase of 10 per cent, affecting 30 per cent of the employees in two plants, 15 per cent in the third mill, and 12 per cent in the fourth firm. Five plants gave an increase of 10 per cent to the common labor, or 10 per cent of the employees, and an increase of 6.8 per cent to the puddle-mill men, or 80 per cent of the force; while another concern that also gave an increase of 10 per cent to the common labor gave an increase of 10 per cent to the puddle-mill men, which constituted 70 per cent of the employees in that establishment. One plant granted the common labor, or 5 per cent of the employees, an increase of 10 per cent. Four establishments reported an increase of approximately 10 per cent affecting the entire force in three firms and 88 per cent of the employees in the fourth concern. With the exception of the clerical force, all employees in one firm received increases ranging from 2½ to 17½ cents per hour. All the employees in one plant received increases ranging from 6 to 8 per cent, while the entire force in another mill were granted increases ranging from 5 to 8 per cent. Three firms gave an increase of 7½ per cent affecting 60 per cent of the force, about 20 per cent of the employees and the bar department, respectively, and the third concern also gave an increase of 9 per cent to the men in the sheet department; one-half of the force in one establishment was given an increase of 7 per cent. One concern granted an increase of 6.8 per cent to 75 per cent of the employees, while another plant gave an increase of 6.8 per cent to the puddle-mill tonnage men, 5 per cent to the finishing-mill tonnage men, and 14 per cent to the remainder of the employees. Three establishments reported a 6 per cent increase affecting 60 per cent of the employees in the first mill, 50 per cent of the men in the second, and 33 1/3 of the force in the other plant."

Speaking of the benefits of industrial medicine before the members of the Cincinnati Chamber of Commerce, Dr. C. P. McCord, of the medical department of the University of Cincinnati, said that there was on an average 3700 people a day absent from work among the 125,000 working people in Cincinnati. Much of this absence could be cut down with proper medical supervision. The aim of medical inspection was to relieve workers of suffering from diseases which otherwise would not be attended to, thereby giving them better health. About 5 per cent of the large employers of Cincinnati had proper medical departments connected with their factories. He advised small factories and shops to form groups so that the work could be carried on economically.

The American Seeding Machine Co., Richmond, Ind., through its president, James A. Carr, announced on June 18 that the Richmond plant, covering 12 acres and employing 800 men, had been sold to the International Harvester Co. and that the transfer is to be made on June 30. The Springfield, Ohio, plant of the American Seeding Machine Co. is not included in the deal.

Directors of the Crucible Steel Co. of America met in its general offices, Oliver Building, Pittsburgh, Wednesday, June 16, and declared a stock dividend of 16 2/3 per cent, and a cash dividend of 2 per cent on the common stock. The company will also pay a dividend of 1¾ per cent on its preferred stock on July 1.

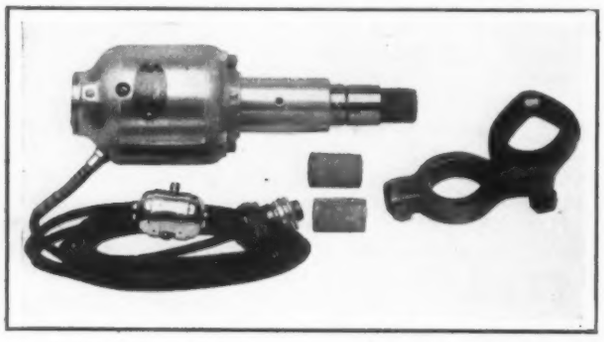
Ferromanganese and Manganese Ore in Great Britain

The situation in the British ferromanganese industry is thus pictured in a market report in a recent issue of the London *Iron and Coal Trades Review:*

As hitherto, there is no lack of inquiry, but very little ferromanganese can be had, while a fair quotation appears to be £55 a ton f.o.b. for 76-80 per cent. Some sellers quote as high as £60, although the official maximum remains at £37 and £45 for the home and export trade respectively. Silico-manganese is being increasingly inquired for, and America is inquiring for a three figure quantity with high manganese content. Several alloy makers who have not previously done so are now considering the possibility of manufacturing this material. At present, owing to the demand, supplies cannot be promised for delivery under about two to three months. Prices vary a little, according to analysis, and range from about £60 per ton on a 60 per cent manganese content, or 20s. to 21s. per unit of manganese content in the alloy. The position continues to be affected by the limited supplies of manganese ore, while business therein is as difficult as ever. It is reported that quantities are now on the way from Poti, which material is badly needed, and meanwhile the tendency of the market is quite firm at about recent quotations. These are on the basis of about 4s, 6d. for Indian ore, c.i.f. home ports, and about 4s. for Caucasian. The first cargo of Caucasian ore, 7000 tons, which has reached this country since 1914 has been delivered to the United Steel Co.'s works at Workington. It is said to be worth £84,000, whereas in 1914 its value delivered would have been only £11,200. The practice adopted will be to use the Caucasian ore along with a proportion of manganese ore from India, the resulting ferromanganese thus obtained being much better in quality than can be produced by smelting either ore separately.

Truing Machine for Grinding Wheels

The Precision Truing Machine & Tool Co., Cincinnati, is placing on the market a new model tool quite radical in design. The old model was of abradant wheel type, while the new is of abradant nib. The new model is ball-bearing throughout with provisions for taking up wear, and has dust-proof mountings which make it practically water tight. The bearings



Truing Machine with Abradant Nib for Grinding Wheels

are protected by felt washers, thus preventing escape of lubricant.

A bracket or holder is provided with each tool. The machine is operated at an angle of 5 degrees, with the cutting side of the nib running in opposite direction to the grinding wheel. Nibs are 1 in. in diameter by 1½ in. long, and are rated, on an average, to keep a grinding wheel in condition for 100 hours.

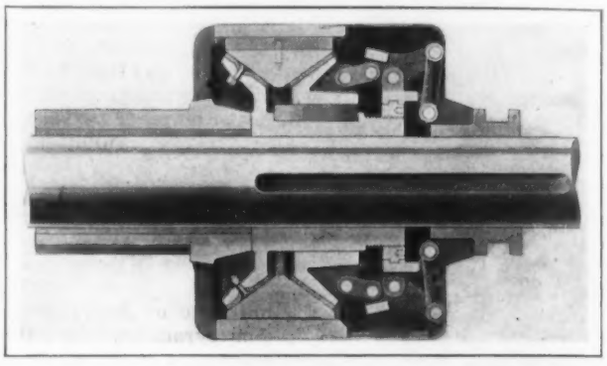
Tight-Fitting Threads for Bolts and Nuts

The problem of securing a thread that will not loosen was discussed by Chester B. Lord, general superintendent Wagner Electric & Mfg. Co., St. Louis, at the spring meeting of the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York, held in St. Louis, May 24 to 27. The problem to be solved, he stated, is as follows: "Without sacrifice of strength, without increase of rejection, without additional manufacturing costs, find a method whereby a male and female thread of the same lead and pitch diameter may be made after repeated loosenings to fit right without the aid of a locking device."

The reasons for departing from accepted practice were presented and discussed, and as a result of experimental work, the author draws the following conclusions: "The cause of stripped threads is lack of room into which the metal can flow; the pitch diameter should be the same in both threads; the lead should be the same; the thread angle should differ by not more than 10 deg.; the limits for the inside diameter of nut need not be adhered to closely, as the inner part of the nut thread exerts very little, if any, holding power; the outside diameter of plug and pitch diameter of both plug and nut are important and should be adhered to fairly closely."

Twyncone Friction Clutch

A friction clutch known as the Twyncone and applicable to any transmission system is a recent product of the Link-Belt Co., Chicago. A feature emphasized is one-point adjustment. All moving parts are inclosed, making for safety. It is stated to be perfectly balanced, this being an advantage, as it allows the clutch



Cross-section of Twyncone Friction Clutch, Which Has One-Point Adjustment

to run at very high speed without causing it to "throw in" or out.

High speed, it is explained, does not affect its operation. It can be "eased in" when running at any speed. The friction cones are lined with thermoid. All parts are accessible, and can readily be replaced should the necessity arise.

Steel & Tube Co. of America Earnings

Earnings of the Steel & Tube Co. of America fell off sharply in 1919, according to the annual report which shows net profits after fixed charges of $3,962,445, compared with $7,877,317 in 1918. Gross sales amounted to $44,120,605, compared with $58,058,598 the preceding year. Gross profits after Federal taxes were $6,080,915, against $9,706,718 in 1918. The report shows that gross earnings after Federal taxes for the first four months of the current year amounted to $3,569,464.

The report says: "The year 1919 presented most unusual problems, beginning with a period of readjustment from wartime conditions, serious embarrassment throughout the year, due to inadequate transportation facilities and ending with labor troubles. Taking all these circumstances into consideration, the results of the year's operations must be considered as highly satisfactory.

Unfilled orders on the books of the company at the end of 1919 amounted to 603,000 tons of pipe, steel and pig iron, which more than covered the company's production for the first half of 1920.

The Pennsylvania Engineering Works, New Castle, Pa., has been awarded the contract to rebuild and enlarge No. 2 blast furnace of the Carnegie Steel Co. at Farrell, Pa. When the work is completed, the stack will have a daily capacity of 500 tons, and the combined capacity of Carnegie company furnaces at Farrell will be 1,500 tons.

TESTING ENGINEERS

American Society for Testing Materials in Session at Asbury Park.

The committee on steel, A-1, of the American Society for Testing Materials has drawn up a new standard, one for "commercial bar steels." It is proposed for publication in the usual way as tentative for at least a year. The other recommendations of the committee, made to the meeting of the society at Asbury Park, N. J., June 22-25, were largely revisions to established and tentative standards. They were sufficiently extensive in the case of welded steel pipe to warrant rewriting the specifications. A plan to organize a sub-committee on deep drawing steel stock was abandoned for the time being for lack of sufficient interest.

By moving the annual meeting location to Asbury Park, a precedent of fifteen years of meeting at Atlantic City was broken. Some months ago it was learned "that it would be impracticable to arrange for the annual meeting this year to be held at Atlantic City during the week desired" and the New Monterey Hotel, Asbury Park, was selected as the meeting place.

The report of the executive committee showed a net membership increase of 273 and a total membership now of 2754. The scope of Committee E-4 on magnification scales for micrographs was enlarged to a committee on metallography. The organization of two new standing committees was authorized, namely, a committee on screen wire cloth and a committee on nomenclature and definitions. The executive committee now has under consideration the organization of a standing committee on heavy chemicals and a standing committee on pyrometry, the latter having been suggested by Committee E-4 on metallography. The executive committee now has under consideration the organization of a standing committee on heavy chemicals and a standing committee on pyrometry, the latter having been suggested by Committee E-4 on metallography.

Reorganization of Testing Methods Committee

A plan of reorganization of committee E-1 on methods of testing was approved by the executive committee. This provides in part that for administrative purposes there shall be established a reorganized committee E-1 on methods of testing which shall consist initially of seven members selected with special consideration of their interest, experience and ability in methods of testing, and with a view of making the committee as representative as possible of the broad activities of the society. Each standing committee shall then elect not over two members, who shall serve as associate members of committee E-1 during the consideration by the committee of any matters relating to the standing committee they represent. The executive committee is engaged in the selection of the personnel of the committee, but it has been determined that the secretary of the society shall be ex-officio the secretary of the committee.

The executive committee has approved the recommendation of committee E-6 on papers and publications that it shall consist of nine members appointed by the executive committee and ex-officio the secretary-treasurer of the society, who shall be chairman of the committee; and that the terms of office of the members shall be three years, so arranged that the terms of office of three members shall expire each year.

The new standing committee on nomenclature and definitions will receive recommendations concerning nomenclature and definitions from the various committees of the society and either approve them or refer them back to the originating committee with such suggestions and modifications as seem necessary. It will furnish a means for committees working on allied subjects to work together on matters of definitions.

The executive committee approved in principle the use of a single series of standard testing sieves throughout the standards of the society, and has requested that all standing committees give careful consideration of the adoption of the series of standard sieves promulgated by the Bureau of Standards.

In the matter of expressing measurements in both English and metric units, on request from committee A-1 on steel, the executive committee has directed committee E-5 to conduct a comprehensive hearing upon this subject, which all members of the standing committees who are interested will be invited to attend.

In the matter of research on high-speed steel tools undertaken by the engineering division of the National Research Council, J. M. Darke, chief of testing laboratories of the General Electric Co., West Lynn, Mass., and chairman of the society's sub-committee on specifications for tool steels, was appointed to represent the society on the committee of the engineering division. Conversely, duplication of effort in the study of magnetic analysis has been avoided by the appointment of a representative of the engineering division on the society's committee A-8 on magnetic analysis.

Joint Committee on Pattern Practice

A joint committee on standard pattern practice has been organized under the sponsorship of the American Foundrymen's Association and consists of two representatives from each of the following organizations: American Foundrymen's Association, National Association of Pattern Makers, Steel Founders' Society of America, American Malleable Castings Society, Metals Division of the American Institute of Mining and Metallurgical Engineers and the American Society for Testing Materials. The representatives of the society on this joint committee are J. C. Davis, American Steel Foundries, Chicago, and George Correy, Worthington Pump & Machinery Co.

Edgar Marburg Memorial Scholarship

The executive committee reported that the Edgar Marburg memorial scholarship was formally presented to the University of Pennsylvania and accepted by the university on July 23, 1919. It is a gift in the form of an endowment of $5,000, the interest of which maintains a scholarship that is to be held by a student in the Department of Civil Engineering of the University, of which Dr. Marburg was professor-in-charge from 1892 until his death in 1918.

The Step Beyond Physical Tests

The presidential address of J. A. Capp, chief of testing laboratory, General Electric Co., Schenectady, N. Y., was devoted in part to the problem "on what properties does the suitability of a material for particular applications depend and how may these properties be used to measure suitability." He said in part:

"When it has become the custom to apply a certain set of tests to estimate the quality of a certain material, we are very apt to keep on using these same tests, changing only the numerical values expected, even when progress in manufacture has gone so far that the material itself has changed almost radically in its qualities. When new materials are developed, we are apt to apply tests which have customarily been applied to other materials of a more or less similar nature, and if the results are not too glaringly bad, we are prone to continue these tests, even though a moderate amount of study would show that the new material is just enough different from those which we have been accustomed to testing to require considerable revision of our testing methods to develop the qualities of the new material concerning which we must have accurate knowledge. Obviously, these remarks apply more specifically to what are usually called physical tests, but which might properly be called mechanical tests.

"The revision of the organization and scope of committee E-1 on methods of testing is designed to provide the means by which a more intensive study of methods of mechanical testing may be made possible. It is the hope of the speaker that as the result of the new scheme of working of this committee our technical committees generally will start as intensive cultivation of the field of methods of testing as they have of the field of specifications. The development of one

should parallel and also keep pace with the other.

"The first and most obvious thing to do, when our committees were first organized, was to attempt to put in order and classify the available facts about the materials on which tests had commonly been made. From this, the next step was standardization, both of methods of testing and of the results to be expected when materials are tested by the established methods. With this accomplished, we have the means of knowing whether our materials are good or bad of their kind and even of comparing them one with another in a scale of reasonable accuracy. Is not the next step, the determination of what our materials are good for and why?"

Commercial Bar Steels

The various features of the report of the committee A-1 on steel will be taken up in THE IRON AGE of July 1. In respect to the specifications on commercial bar steels, it may be stated that they were submitted by a sub-committee enlarged from a committee on cold-drawn steel to include also hot-rolled bars to be purchased to chemical composition. Both open-hearth and Bessemer steels are specified, and bars may be hot-rolled or cold-finished as specified. The sections covered are rounds, squares and hexagons of all sizes and flats not over 6 in. wide. The principal requirements of the specifications are chemical properties and permissible variations in dimensions.

Officers Elected

Officers for next year were elected as follows:

President, George S. Webster, director department of wharves, docks and ferries, Philadelphia.

Vice-president, Dr. George K. Burgess, chief of division of Metallurgy, Bureau of Standards, Washington.

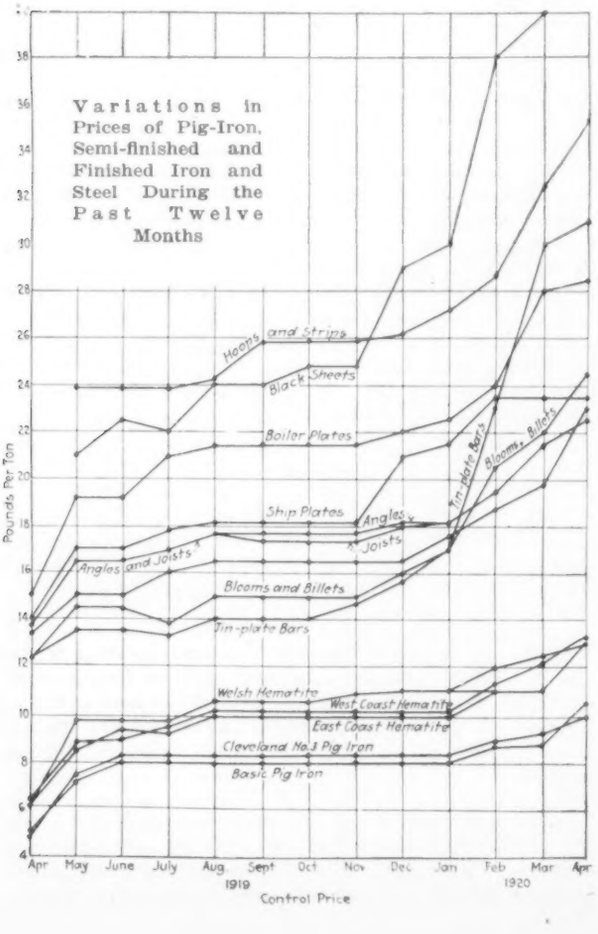
Members of Executive Committee: L. G. Blackmer, Blackmer & Post Pipe Co., St. Louis; D. E. Douty, general manager United States Conditioning & Testing Co., New York; Prevost Hubbard, chemical engineer, Asphalt Association, New York; R. S. Whiting, National Lumber Manufacturers' Association, Chicago.

British Iron and Steel Prices Since the War

Larger Advance Since the Removal of Government Control—Pig Iron Doubled and Other Increases Greater

THE course of the British iron and steel market since the removal of government price control in the spring of 1919 is interestingly discussed in an article, "A Year's De-Control in the Iron and Steel Industry," in the London *Iron and Coal Trades Review* for May 28, 1920. An abstract follows:

It is just over a year ago that the iron and steel industry was released from government control, and the various subsidies withdrawn. On May 1, 1919, prices were again regulated by the laws of supply and demand. The system of subsidies was perhaps a convenience during the war, as it simplified the Ministry of Munitions' accounting during a period of rising prices, and it was hoped, too, that by fixing prices, wages might also be more readily stabilized. In this, however, the subsidies entirely failed, and, save for a few modifications in the control prices of certain products, the various wage increases, together with increases in the cost of materials, were added to the subsidies paid by the government to the makers. Hence the removal of control necessarily involved a large advance in prices, in order to restore the industry to a self-supporting basis.



The first year of de-control has been disappointing, chiefly through labor unrest and its attendant ills from which industry still suffers. Probably the least satisfactory feature has been the great scarcity of pig iron, and especially of foundry qualities, in spite of the fact that the English foundries were idle for about four months, and consumption in that direction largely ceased. The scarcity of pig iron has resulted partly from irregular working of blast furnaces, due to strikes and holidays, and partly from an acute shortage of coke, as well as transport facilities. Coke supplies have slightly improved since exports were prohibited early this year, but there is still insufficient to insure regular working. The blowing out of blast furnaces for relining following the signing of the armistice affected the output in some cases well into 1919, while recovery was hardly possible before the railroad strike again affected the output for a considerable period.

While there is a slight improvement in the pig iron output since the beginning of the present year, as shown from the figures compiled by the Federation of Iron and Steel Manufacturers, the rate is only just over 9,000,000 tons, as compared with over 10,500,000 tons in 1913. The output of steel ingots in 1919 was below 8,000,000 tons, but recent figures show a considerable improvement, being at the rate of over 10,000,000 tons for the first three months of this year.

Fortunately for the industry here, the adverse exchange and high freights have prevented any serious American competition, but with outputs increasing, an outlet for surplus production will be necessary, and, with the exchange improving, competition must be expected in the near future.

The result of world-wide difficulties has been to create an unprecedented demand for all kinds of British iron and steel, both on home and foreign account. Prices have been no object when delivery could be guaranteed, and the volume of business has been limited only by production, and the great scarcity of iron and steel has resulted in makers' official prices being purely nominal, premiums being readily obtainable.

Further, the uncertainty of production costs for future deliveries has compelled makers to insert in all contracts a clause protecting themselves against increased costs, and fixing prices at those prevailing on date of delivery. This appears to have reacted slightly on recent neutral inquiries, while home consumers show some tendency to hold off in connection with forward contracts; but this, notwithstanding, works are booked up for months ahead, with production still far behind the demand, and even with a perceptible growth in recent American shipments competition can hardly yet be said to have commenced, in view of the continued world shortage, which is likely to continue for many months.

The curves shown in the illustration indicate the control price in force up to May 1, 1919, and show approximate prices ruling at the beginning of each subsequent month down to April, 1920, the prices for this latter month being those quoted toward its close. As will be seen from the curves for pig iron, this commodity has more than doubled in price during the past 12 months, and with fuel and labor costs still increasing, and the demand as urgent as ever, prices are likely to rise to appreciably higher levels. Table 1 shows the percentage increase in prices of pig iron to date over those of 1914 and 1919 (control prices) respectively.

In the case of semi-finished and manufactured products, the percentage increase has varied considerably, ranging from 65 per cent for beams and angles to about 150 per cent for sheet bars. One curious feature brought out in Table 2, and doubtless caused

Table 1.—Percentage Increase in Pig-Iron Prices.

Description	Control price, April 1919			Price, April 1920			Percentage increase over April 1919	Percentage increase over April 1914
	£	s.	d.	£	s.	d.		
East coast hematite	6	2	6	13	0	0	112	320
West coast	6	7	6	13	5	0	108	325
Basic	5	0	0	10	10	0	110	320
Cleveland No. 3.	4	15	0	10	0	0	110	292

Table 2.—Percentage Increase in Semi-finished and Finished Steel.

Description	Control price, April 1919			Price, April 1920			Percentage increase over April 1919	Percentage increase over April 1914
	£	s.	d.	£	s.	d.		
Rails	13	7	6	23	0	0	69	283
Ship plates	14	0	0	23	10	0	68	260
Boiler plates	15	10	0	28	10	0	84	268
Joists and Angles	13	12	6	22	10	0	65	240
Blooms and billets	12	5	0	24	10	0	100	415
Tin-plate bars	12	5	0	31	0	0	150	590

by the great demand for sheet bars, is that while in 1914, rails cost 25s. more than blooms and billets, the latter are now 30s. more than rails, while beams and angles are £2 lower than blooms and billets, which in 1914 were 37s. 6d. less than the finished material.

Regarding export prices as obtained from the Board of Trade Export Returns, these usually reflect conditions which in most cases are from three to six months' old, and it is therefore impossible to give with any accuracy, export prices for the period under review.

Russian and Indian Manganese Ore

The following comments in the London *Ironmonger* on manganese ore conditions in Russia and India are of interest to American ferromanganese producers, particularly those who have made large purchases of Indian ore recently:

Some interest has been aroused by the news that a cargo of Caucasian manganese ore has been received at the United Steel Co.'s works at Workington, but it is not correct that this is the first consignment of ore from the Caucasus to reach Great Britain since 1914. There have been one or two previous shipments to this country, the first, which was exported from Batum last December, having arrived here in January of this year. The uncertainties of shipment, however, due to the disturbed state of the Caucasus, make it difficult to re-establish trade on a satisfactory footing. The merchants who hold the ore at Batum have formed themselves into a corporation, possibly a revival of the Manganese Producers' Association which existed in that district before the war, and are anxious to do business with British firms, but at present they are trying to supply users direct. Business operations are, of course, very much handicapped by the difficulties of communicating with the Caucasus, and the recent political troubles have interrupted all negotiations.

Another point which deprives the manganese industry of the Caucasus of much of its commercial value just now is that, although it is believed that heavy stocks are lying ready for shipment at Batum, no production has taken place at the mines since 1917, and before work can be resumed it will be necessary to reconstruct the railroad which brings the ore from Poti to Batum. The most recent quotation for Caucasian manganese ore is about 4s. per unit, compared with the 4s. 6d. asked for Indian manganese, but it is only occasionally that a vessel freighted to the Black Sea can be sent under a safe-conduct to fetch ore from Batum.

Consumers of manganese ore are also suffering from a shortage caused by the delay in shipments from India. There is a great deal of ore already sold and awaiting export, but owing to transport congestion only small quantities are arriving. One of the principal causes is the reduction, during the war, in the number of coasting vessels plying from Calcutta to Bombay, which throws a greatly increased freight traffic on the Indian railways. The Indian Government has been obliged on several occasions recently to stop the movement of manganese ore altogether, or to restrict it to 200 tons per day in order that coal transport may be as little interfered with as possible.

Financial Plans of Youngstown Companies

Plans of financial reorganization have been revised by the Youngstown Sheet & Tube Co. and the Brier Hill Steel Co., both of Youngstown, Ohio, and will be submitted to stockholders at special meetings on July 2. Both involve the issuance of non-par value common stock to be exchanged for the existing outstanding common. Both companies ask shareholders to waive rights to blocks of the new common which it is proposed to offer to employees.

A stock dividend of 15,034 shares will be paid July 1 by the Sheet & Tube company to distribute unissued common, but the plan to increase the common capitalization from $20,000,000 to $100,000,000 has been abandoned. Instead directors recommend the exchange of the new non-par common for the present stock on the basis of four of the new to one of the old, and the outstanding preferred, amounting to $10,000,000, to be unaffected.

Stockholders are asked to appropriate and set aside 100,000 shares of the new common to be offered to workers on a deferred payment basis. On the basis of an existing market value of $345 for common, the new stock should sell between $85 and $90.

The company will issue 1,000,000 shares of common, of which 800,000 will be absorbed by the exchange of stock, 100,000 will be held in the treasury, and 100,000, according to proposal of directors, will be retained for offer to employees.

The Brier Hill Steel company directors ask shareholders to ratify a plan of reorganization which embodies the issuance of 1,250,000 shares of common capital without nominal or par value; in place of and for the present outstanding 125,000 shares of common to issue 750,000 shares of the new stock, the exchange to be on the basis of six to one; and to set aside 150,000 shares for sale to employees. The preferred stock shall not be changed. It amounts to $5,000,000.

Under the new plan the amount of working capital is to be $5,000,000 of preferred and $12,500,000 of common. After the exchange, there will remain 500,000 shares of no par value common in the treasury.

Fire which swept through the steel building at the benzol plant of the Republic Iron & Steel Co., Youngstown, Ohio, on the evening of June 15 caused a loss of $75,000. Sparks from a passing locomotive are thought to have caused the plaze, which was discovered by employees.

The new plant of the Youngstown Steel Car Co. at Niles, Ohio, turned out last week its first car of 55-tons capacity. The plant will be steadily operated, and in addition to car building will engage in repair work.

Construction Started on Sheet Mill at Indianapolis

Construction has started on the new four-mill sheet plant which is being erected by the Chapman-Price Steel Co. on a 50-acre site on the outskirts of Indianapolis, with Pennsylvania railroad frontage. Equipment contracts have been awarded. Work will be pushed to completion and it is expected production will commence late in the fall. The plant will have galvanizing equipment and will include a fabricating unit. It represents the initial sheet-producing capacity in the Indianapolis territory and is being fully financed by Indianapolis interests.

The output of the sheet mills will consist of black and galvanized sheets, while the fabricating plant will produce gutters, troughs, eavespouts and other kindred sheet metal products. Whether any sheet capacity will be available for the market will depend upon demand for the fabricated production of the company.

The new plant will replace a works operated for many years by the old Chapman Steel Co., a fabricating interest which purchased its sheet requirements, and whose property was destroyed by fire in March. Following the fire, the company was reorganized under the name of the Chapman-Price Steel Co., with a capitalization of $1,500,000 divided into $1,000,000 of common and $500,000 of preferred. All of the common has been issued and about half of the preferred, proceeds being used in part for construction purposes.

Officers of the company are Niles Chapman, president and treasurer; L. H. Price, vice-president and sales manager; J. J. Beck, vice-president in charge of mills and the galvanizing department. Lief Lee, consulting engineer of Youngstown, Ohio, 906 Wick Building, is handling the engineering work for the company. Mr. Beck is now superintendent of sheet mills of the Youngstown Sheet & Tube Co. at its East Youngstown works. Edward S. Plott, turn foreman for the Sheet & Tube company, will be superintendent of mills of the Chapman-Price company.

The company will have an annual productive capacity of 24,000 tons of sheet steel, and will employ 350 men. Work of building up an operating organization is now going forward.

The plant will consist of four main buildings including the principal structure to house the mills, which will be 85x280 ft.; another building 85x280 ft. for sheet bar storage and the furnaces; galvanizing building 60x260 ft. and fabricating department in a structure 80x260 ft. In addition there will be a main office building 32x64 ft., two stories, of brick and steel construction.

The contract for steel for the buildings and its erection has been awarded the Blaw-Knox Co., Pittsburgh; for cranes to the Morgan Engineering Co., Alliance, Ohio, and for mills, shears and doublers to the Birdsboro Steel Foundry & Machine Co. of Birdsboro, Pa.

Taylor Society in Conference for Sales Managers

Planning and control in the sales department will be considered at a conference for sales executives under the auspices of the Taylor Society at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on June 25. The holding of such a conference was suggested at the convention of the Taylor Society at Rochester, May 6 to 8, for the reason expressed by one of the participants: "I am sure that the sales department of a firm that is employing scientific methods in production cannot function successfully without co-ordinating scientific selling with scientific production, and the money spent in developing scientific production is to a certain extent nullified by unscientific sales operations."

Two 30-min. talks will be given by W. E. Freeland, sales engineer Winchester Repeating Arms Co., New Haven, Conn., formerly of THE IRON AGE editorial staff, on "Co-ordination of Sales with Scientific Production," and John M. Bruce, Webb, Kendall & Bruce, New York, on "Control of Selling Operations, Based on Analysis of the Salesman's Job." There will be discussions of five minutes each by five managers called upon by the presiding officer. Luncheon will be served at 1 o'clock at Keen's Chop House, 72 West Thirty-sixth Street, followed by discussions of five minutes each. Henry S. Dennison, president Dennison Mfg. Co., Framingham, Mass., president of the society, will state the problem at the beginning of the session at 10.30 a. m.

Non-members of the society, particularly sales executives, are invited. According to the director, "persons planning to attend this meeting are requested to drop a line indicating such intent to the Taylor Society, that a proper 'job analysis' of the problem of handling the conference (and especially the luncheon) may be made."

New England Iron and Hardware Association Officers

The New England Iron and Hardware Association held its annual election on June 15 at Young's Hotel, Boston. Charles W. Henderson, president, presided. During the year ended May 31 last, the organization had a net loss of three members. The following officers were elected for the ensuing year: Fred L. Avery, president, succeeding Mr. Henderson, who served for two terms; Myron B. Damon, vice-president; Charles H. Breck, treasurer. George J. Mulhall was re-elected clerk.

Directors elected were: Charles A. Adams, John B. Verick Co., Manchester, N. H., hardware; Fred L. Avery, Avery & Saul, Dorchester, Boston, metals; R. M. Boutwell, Standard Horseshoe Co., Wareham, Mass.; Charles F. Bragg, N. H. Bragg, Bangor, Me., hardware; E. R. Brayton, Belcher & Loomis Hardware Co., Providence, R. I.; Myron B. Damon, Fitchburg Hardware Co., Fitchburg, Mass.; Herbert Field, Congdon & Carpenter Co., Providence, hardware; George M. Gray, Peter Gray & Sons, Cambridge, Mass., lanterns; Charles W. Henderson, A. C. Harvey & Co., Allston, Mass., hardware; A. B. Marble, Jones & Laughlin Steel Co., Boston, and Frank A. Marvin, Dodge, Healey Co., Boston, hardware.

Coal and Coke Production

WASHINGTON, June 22.—Production of bituminous coal increased somewhat during the week ended June 12, but that of beehive coke declined slightly during the week, according to the reports of the Geological Survey.

The output of soft coal reached the highest level during the week of any attained since the switchmen's strike. The total output, including bituminous, lignite and coal coked at the mine, is estimated at 10,332,000 net tons. Compared with the 9,568,000 tons produced in the latest preceding full week, this was an increase of 8 per cent. The average production per working day was 1,722,000 net tons. This was still 6 per cent below the rate just before the switchmen's strike and 17 per cent below that of October, 1919.

The total output of beehive coke during the week ended June 12 is estimated at 408,000 net tons, a decrease when compared with the preceding week of 4,000 tons. The cumulative production of beehive coke is estimated at 9,762,000 tons, an increase over the corresponding period of 1919 of 823,000 tons.

Injunction Suit Continued

WASHINGTON, June 22.—The suit begun by 22 steel companies in the Supreme Court of the District of Columbia to restrain the Federal Trade Commission from compelling them to furnish monthly cost of production figures came up for hearing yesterday, but a continuance was granted. The temporary restraining order was continued in effect with either party having the right to have the case called for further argument at 10 days' notice.

It is a question of dispute whether the restraining order affects the two mandamus suits already brought by the commission against steel companies. The commission contends that it does not. This point will be decided when the case comes up again.

WATER POWER ACT SIGNED

Important Development Expected, Especially in the Far Western States.

WASHINGTON, June 22.—President Wilson's eleventh-hour signature of the "water power bill" has set in operation the Governmental machinery by which it is planned to develop at least 4,000,000 hp. of current from American rivers. No estimate is available concerning the amount of money which will be spent in this development, but the promoters of the legislation declared that hundreds of millions of dollars were awaiting the enactment of Federal statutes which would unlock the power possibilities of the streams under Government control.

These projects are of the greatest importance to the entire iron and steel industry, because it is estimated that at least 25 per cent of the capital to be invested will be spent for iron, steel, and machinery. From an industrial standpoint, the chief result will be a decided movement westward for the center of industrial production, as the larger share of the available water power resources is in the West.

Seventeen navigable rivers alone are expected to furnish 2,122,000 hp. when their development has been fully carried out. The other 2,000,000 are to come from non-navigable streams or from rivers of less importance. The largest project will be that of the Columbia River development in Washington, which is credited with a development possibility of 410,000 hp. In the same State, the Pend Oreille River is credited with 250,000 hp. The Tennessee River, in Alabama, is also credited with 410,000 hp., although plans for its utilization are not so far advanced as those in Washington. The Little Tennessee River in North Carolina is put down for 200,000 hp.; the New and Roanoke rivers in Virginia for 20,000 and 35,000 respectively; the Savannah in South Carolina and Georgia for 78,000; the Flint and Chattahoochee in Georgia for 138,000 and 20,000 respectively; the Coosa in Alabama for 180,000; the Cumberland in Kentucky for 26,000, and the Clinch River in Tennessee for 25,000.

The Missouri River in Montana is expected to furnish 100,000 horsepower, the St. Croix in Minnesota 30,000, and the Des Moines River in Iowa 60,000. In New England, the chief development is to be on the Connecticut River, which is scheduled for 30,000 hp. in the states of Massachusetts and Connecticut.

The men who fathered the measure in Congress, hower, talked in far larger figures. Senator Jones of Washington, the chief author of the bill, estimating the ultimate development of American rivers at 61,678,000 hp.—equivalent to the annual consumption of 780,000,000 tons of coal, more than the entire coal consumption of the country at present.

Senator Jones also put a series of letters from American machinery manufacturers into the record. One of these, from the William Cramp & Sons Ship & Engine Building Co., Philadelphia, said:

"This company, as one of the largest and probably the largest manufacturer of waterpower machinery in this country, is in close touch with the situation existing in the field of waterpower development, both in this country and abroad. The utilization of our waterpower resources has in the last few years come to a standstill, and at present there are practically no developments of major importance being carried on in this country. The shops of this company which are normally intended for the manufacture of the machinery required in waterpower plants are almost completely idle, and we have been obliged to lay off a large part of our force in this department on account of the lack of orders; and we know that the same condition exists with all of the manufacturers in this country.

"At the present time this company is receiving about three foreign inquiries for waterpower machinery to every one received from within the United States."

A similar letter was put into the record from S. Morgan Smith & Co., York, Pa., "one of the largest manufacturers of turbine water wheels in the country." The Allis-Chalmers Mfg. Co. of New York wrote that it had five times as many foreign orders for this type of machinery on its books as it had of domestic orders.

Important Legislation for the State of Washington

SEATTLE, WASH., June 22.—Authorities in Seattle, men fully conversant with completed and proposed hydroelectric development throughout the Northwest, state that the signing of the waterpower development bill by the President does not presage immediate construction of plants on sites on the public domain in his section; in fact, as near as can be learned, none is planned. The new legislation is, however, extremely important to the State of Washington because there exists in the Federal reserve in this commonwealth more potential horsepower per square mile than in any other State in the Union. The impression has gone forth that this section of country has been held back on account of the repressive policy of the Government adopted at the height of the conservation program. This is untrue. Hydroelectric development to date has proceeded apace with requirements; in fact, has outstripped actual requirements by a comfortable margin. At the present time, plans for further waterpower development are under way, but these projects are not on land in the Federal reserve with the exception of the Skagit River power project for the city of Seattle municipal system for which a special permit for development was granted long since.

By many the long fight to unshackle the waterpower of the country existing within the public domains as it relates to the State of Washington for its immediate needs is branded as newspaper and magazine twaddle and ammunition for politicians. This section has plenty of available hydroelectric sites which are not located in Federal reserve.

Power Development in South

BIRMINGHAM, ALA., June 22.—The Alabama Power Co. will at once begin formulation of plans for the building of a 75-ft. power dam at Duncan's Riffle on the Coosa River, 18 miles below the present power dam at lock 12. The new dam will generate 100,000 hydroelectric hp. Ultimately dams will also be built at locks 7 and 18, generating 130,000 hp. more. The complete Coosa scheme calls for 350,000 hp. The company also has sites at Cherokee Bluffs and Little River which will generate 150,000 additional hp.

Freight Rates on Raw Materials

BIRMINGHAM, ALA., June 22.—James Bowron, president the Gulf States Steel Co., will appear before the Interstate Commerce Commission at an early date and give data showing why the raw material assembling rates to furnaces in Alabama should be basically revamped, so as not to bear what Alabama operators allege is a disproportionate application of the advanced rate schedule. In many instances the advance has been more than 100 per cent.

The Holaday-Telford Co., pattern maker, Waterbury, Conn., has increased its capital stock from $10,000 to $60,000, and now has one of the largest plants in New England, equipped with the latest machinery for making patterns. It has just purchaser a Monarch lathe of the Brownell Machinery Co., Providence, R. I., also several small tools.

The fall meeting of the American Electrochemical Society will be held in Cleveland. The date has not been definitely fixed, but it will probably be in the week following the Sixth National Exposition of Chemical Industries, New York, which is scheduled for Sept. 20 to 25. Members are urged to provide papers for the meeting. It will be impracticable to get them printed before the meeting unless they are received on or before Aug. 1.

CO-OPERATION IN RESEARCH

Training of Exceptional Intellects Urged—How to Approach the Problem

Some present day research problems were discussed by Prof. Vladimir Karapetoff of Cornell University before the Erie, Pa., section of the American Institute of Electrical Engineers on May 17. One division of research problems, Prof. Parapetoff said, is based upon the caliber and mental equipment of the investigator himself. "A few men of superior caliber and thoroughly trained," he said, "will accomplish results on which thousands of less gifted and not so thoroughly trained investigators may work for many years without much progress.

Exceptional Intellects Should Be Developed

"The necessity for better care of persons of exceptional scientific intellect is so urgent that it is legitimate to ask ourselves what our government, leaders of industry, educational institutions, or any other agencies are doing in this direction. The answer is, next to nothing. Moreover, in this imperfect world of ours, it is no one's particular business to attend to the proper development of geniuses.

"I do not have in mind a somewhat utopian scheme of breeding a race of intellectual giants by careful mating. I have in mind a perfectly feasible scheme of detecting exceptional children by suitable mental tests and then guiding them year after year to the full development of their mental powers. This is a proper function of the state and some day will become a reality."

"Physical, chemical or mathematical research," the speaker said, "involves first of all a method of approach, a method of attack of a certain group of related problems, based on a thorough familiarity with the resources of that particular science. Promotion of research, therefore, consists primarily in the encouragement of the study and further development of such methods and not in the acquisition of a large number of unrelated facts. A scientist trained, say, in alternating currents will be prepared to approach a new problem in this field with much better chance of success than one who has had merely general practical experience and beats about the bush in an effort to discover a short cut by luck.

"Thus the promotion of pure research is another national problem, and the first aim must be the training in the methods of analysis, general laboratory methods, the ability to find what is already known, the use of mathematics, the use of methods borrowed from other branches of science, general accuracy of measurements, of computations, of statements, and, last though not least, that loving attitude towards nature and the intuition that comes only from a first-hand contact and observation of actual physical phenomena without any preconceived theory of utilitarian thought."

Experimental and Theoretical Research

The next division of research problems, Prof. Karapetoff said, is into experimental, mathematical, inventive, critical, indicative of new fields, etc. "A clear understanding of this division on the part of investigators themselves and of their business managers will help scientific progress materially in that it will allow each one to apply his effort, imagination, and inspiration where it will bear the best fruit and it will enable two or more investigators to combine their efforts without jealousy or duplication.

"Almost any big research problem involves some theoretical study as well as experimental skill, inventive ability, and patient search for the work of other investigators and its critical analysis. Only a very few investigators possess all these accomplishments to the same degree, and it is in the hands of a harmoniously organized group of scientific workers of different talents that research leads to gratifying results.

"The Anglo-Saxon race is individualistically inclined perhaps to a greater degree than the other civilized races. The Americans among the Anglo-Saxons are especially prone to exhibit the western pioneer spirit in research with all its virtues and shortcomings of which the utter disregard of the work of preceding investigators is perhaps the most characteristic one.

"I do not mean to imply for an instant that an original thinker should be hampered in the flight of his fancy by laboratory assistants or by skilled mediocrities, in the name of a misapplied principle of co-operation. I mean two other things. First, to clear a big idea in his mind, he ought to know how to let go of it and allow his assistants to play with it for a while and see how it shapes itself in detail. Secondly, if in the preliminary molding of his ideas he should be handicapped by his lack of mathematical ability or of foreign languages (two handicaps common in this country) let him not try to solve the problem in an imperfect manner alone, without first having exhausted the possibilities of associating with other gifted and congenial minds who may furnish the missing needs of the problem.

"The possibilities of co-operation in research on the part of persons of different temperament and ability go far beyond the confines of one industrial organization or even one country. International co-operation in research is just as important in view of the favorable and unfavorable racial idiosyncracies. Any one who follows European scientific magazines cannot fail to notice these racial distinctions in the treatment of identical subjects.

"We in this country with its polyglot population have had an exceptional opportunity to observe and to benefit by this co-operation right in our midst, even though in our Anglo-Saxon arrogance we are apt to look down upon our brothers from across the seas. There is hardly an organized institution for research in this country that cannot point to benefits derived from associates of foreign birth and training and point of view."

Banking Association for Foreign Trade

The First Federal Foreign Banking Association, 40 Wall Street, New York, has been organized by a group of eleven banks, with the co-operation of a number of manufacturers and men of affairs interested in foreign business. It has an initial capital and surplus of $2,205,000, which will be increased steadily as the new banking expands. Manufacturers will join the association through stock ownership.

The bank is the first to be opened under the Edge law. To make it a success, Frederick Todd, secretary, says, it will be necessary for business concerns to adopt the practice of setting apart a portion of their cash assets which it is not necessary to have subject to check and of investing these in a new kind of security running from six months to a year or two, at better rates of interest than they can get in any other way. "It will be a combination of self interest and support of trade."

Technologic Paper No. 359, "Porosity and Volume Changes of Clay Fire Bricks at Furnace Temperatures," of the United States Bureau of Standards, is a study of some of the physical properties of clay fire bricks by a comparison of their changes in porosity and volume, on heating to different temperatures, with the amount of contraction of the bricks under load at furnace temperatures, and with the so-called melting points of the bricks. It is found that the porosity and volume changes serve as a much more reliable indication of the ability of a clay fire brick to resist deformation under load at furnace temperatures than is the melting point. It is also shown that these porosity and volume changes serve in explaining the failure of fire bricks in use, from such causes as insufficient burning in manufacture.

Molders at the plant of the Weatherle Foundry & Machine Co., Hazleton, Pa., have gone on a strike for an increase in wages of approximately 25 per cent.

Installation of a large electric motor drive and several gas producers in the 44-in. mill of the Steelton, Pa., plant of the Bethlehem Steel Co. is now under way.

SOME DEMANDS DROPPED

Amalgamated Will Not Insist on Shorter Day—Another Meeting With Manufacturers Will Soon Be Held

PITTSBURGH, June 22.—At the meeting at Atlantic City last week of representatives of the Amalgamated Association of Iron, Steel and Tin Workers and of manufacturers of bar iron, sheet and tin plate, at which no settlement of the bar iron, sheet or tin plate scales was effected, the wage committee of the Amalgamated Association, representing the sheet and tin plate mills, asked for a straight advance of 20 per cent in the base of both scales, which the manufacturers refused to grant. The present base on the sheet and jobbing mill scale on Nos. 26, 27 and 28 gage steel sheets is $2.15 per 100 lb., and on the tin plate scale the base is $3.50 per base box, 100 lb. coke tin plate. The wage committee of the Amalgamated Association representing the bar iron mills asked for a straight advance of 15 per cent, which was also refused. The present base of the bar iron scale is $2.28 when bar iron is 1c., when melted from heavy scrap, $2.97 when melted from light scrap or turnings, and $4.50 per gross ton from cast borings.

Request for 6-hr. Day

However, only a limited part of the time of the conference was devoted to the wage scales, more attention being given to the request of the wage committee of the Amalgamated, representing the sheet and tin plate mills, that they be given a 6-hr. day, or in other words, four turns per day instead of three as at present. However, in the wage conference, the Amalgamated wage committee quickly realized that a 6-hr. day in sheet and tin mills was impractical, owing to the acute shortage in the supply of men, and this request was withdrawn.

The matter that occupied most of the time was a clause inserted in the memorandum of agreement in the wage scale for 1919-1920 that expires on June 30. The clause reads as follows:

> It is agreed that when a scale or scales are signed in general or local conferences, said scales or contracts shall be considered inviolate for that scale year, and should the employees of any departments, who do not come under the above named scales or contracts, become members of the Amalgamated Association during the said scale year the Amalgamated Association may present a scale of wages covering said employees, but in case men and management cannot come to an agreement on said scale, same shall be held over until the next general or local conference, and all men shall continue work until the expiration of the scale year.

Clause Not Eliminated

The manufacturers desire that this clause be eliminated from the memorandum of agreement in the scale for the year 1920-1921, but the Amalgamated Association has so far declined to omit it. The association claims that its constitution gives it jurisdiction in sheet and tin plate mills starting with the open-hearth department, and in bar iron mills, starting with the puddling department. At the same time, the association claims that it protects the manufacturers from the fact that even if an Amalgamated lodge is organized in a sheet, tin plate or bar iron mill during a scale year, the men are not permitted to go out on strike, or to call any other men out, should the new lodge fail to make an agreement on wages or any other matters with the company in whose plant a lodge has been organized. At present the Amalgamated has wage agreements in the open-hearth steel plant of the National Enameling & Stamping Co. at Granite City, Ill., and also has wage agreements in all the finishing mills of that company. It has no less than 11 Amalgamated lodges in the entire Granite City plant. It also has scales in force in several other open-hearth steel plants that serve sheet and tin mills for which Amalgamated scales are signed.

Arranging for Another Meeting

The fact that no agreement was reached on a scale for the year commencing July 1 next for the sheet and tin plate mills does not necessarily mean that there will be a strike in the sheet and tin mills that sign the Amalgamated scale, as another conference is being arranged and will probably be held late this week, or early next week. Under the terms of the Amalgamated scale with the sheet and tin plate mills, unless an agreement is reached with them prior to June 30 work has to stop. Another conference can be called on the request of M. F. Tighe, president of the Amalgamated Association, and James H. Nutt, who represents the sheet and tin plate mills that sign the scale.

In case of the bar iron mills, the Amalgamated scale provides that when a settlement is not reached prior to June 30, the bar iron mills that sign the scale can continue in operation until July 31, and this time can be extended if both parties desire to do so. It is stated on good authority that a settlement of the bar iron, sheet and tin mill scales is almost certain to be reached this year without any cessation of work.

The Amalgamated is said to be stronger numerically and financially than at any time prior to the Homestead strike, which occurred in July, 1892. Prior to that strike, the association had about 25,000 members in good standing, but now it is said to have close to 50,000. Before the Homestead strike, the association had about $140,000 in the treasury, all of which was used by the association in that disastrous strike, which it lost, but it is said that now the association has about $340,000 in the treasury. The refusal of the association to call out men working in mills during the steel strike that started on Sept. 22 last year gained many friends for it, and to-day it has more than ever the confidence of the iron and steel men with whom it deals. The Amalgamated Association has demonstrated that when it makes a wage agreement it will observe it.

Railroad Labor Board Is Busy

CHICAGO, June 22.—The United States Railroad Labor Board says there is no truth in the report that its members have taken a vacation. All are working every day on a mass of evidence presented during the six weeks hearing, also have a large volume of data from the Railroad Administration to go through. Hence the decision on wages may not come for several weeks. The present Eastern trouble, the board says, is merely a continuation of the previous walkout and is a fight between railroad men's organizations.

The relation between the elastic strengths of steel in tension, compression and shear was discussed by Fred B. Seely and William J. Putnam in bulletin No. 115, published by the Engineering Experiment Station, University of Illinois, Urbana, Ill. The bulletin presents the results of experiments with soft, mlid and medium carbon steel, and vanadium, nickel and chrome-nickel alloy steel. The elastic strength in tension, in compression, and in shear is given for each of the six grades of steel. The elastic strength in shear is found from tests in torsion with solid cylindrical specimens and with thin-walled hollow cylindrical specimens. Furthermore, a factor is found by the use of which the true or correct shearing elastic strength may be calculated from the elastic strength obtained from a test of a solid specimen. The ratio of this true elastic shearing strength to the elastic tensile strength is given for each grade of steel and its bearing on the theory of combined stress is discussed. The ratio of the elastic tensile strength to the elastic compressive strength is also given and the effect of the amount of rolling upon the elastic tensile and compressive strengths is discussed. The effect of the direction of rolling upon all three elastic strengths is considered for one of the materials, namely, nickel steel.

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THE IRON AGE

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Co-operation Among Railroads

Not a few traffic managers of large patrons of the railroads have become convinced that there has been a decided deficiency in co-operation between the railroads in endeavoring to give service to the public during the rail strike that began early in April and the traffic congestion that ensued. There has been plain evidence at least of railroad companies endeavoring to operate their lines for their own private good, without regard for the interests of competing lines, if indeed there is not evidence that some railroad officials have been willing to see their companies make less money at this time than could be earned by more energetic and intelligent administration.

The plain fact must not be ignored that it was upon the insistence of certain railroads that the Interstate Commerce Commission began to exercise the powers given it by the Transportation Act of last February, in an effort to relieve the traffic situation. There is little or no doubt that the roads in question approached the commission along this line because other roads were not doing their duty.

The situation is that for a period of years the railroads have been endeavoring to win the public to confidence in the management of the lines. This effort has been successful. The public is anxious that the railroads should be treated fairly and that willingness has been translated into law by the new Transportation Act. It remains for the act to operate and for the railroad managements to produce the results the public desires and which the public has been promised.

The Valuation Act is operating to the advantage of the railroads. Practically no one doubts that the passage of this law was secured by those who expected the valuation to show that the railroads were over-capitalized and thus not entitled to earn returns upon their securities issued. Already the valuation returns made are showing a greater value than investment accounts of the roads covered, instead of a less value. The difference, for 50 Class 1 roads having a valuation of slightly over three billion dollars, is less than 2 per cent, but it is a difference in favor of the roads, not against them, while furthermore the valuations cited are those which the division of valuations is prepared to concede, so that any revision that may occur will be upward and not downward. Thus railroad prospects are very favorable in the matter of the rate adjustments under the Transportation Act now being considered.

In desiring that the railroads should now furnish the maximum of transportation of which the equipment is capable, the public is indisposed to ignore the great needs that exist for railroad rehabilitation and expansion. The public desires to see the railroads making the best use of the talents they now have, while they are waiting to be given the use of additional talents. In the matter of freight cars, for instance, the number in service has been practically stationary for several years and the number cannot be materially increased in the near future by new construction. The *Railway Age* states that it has been ascertained that the number of freight cars on the books of car makers June 1 was only 43,000, most of the orders having been placed in the immediately preceding weeks. The railroad journal points out that the car companies in a single year have produced as many as 240,000 cars, while they have a rated capacity of 320,000 cars a year, so that the cars now on order amount to practically nothing. The opinion of the *Railway Age* is that 43,000 cars are less than one-half the number required annually to replace cars that wear out.

It may be added that if unlimited orders were now placed for freight cars there would be great delays in delivery, on account of difficulty in securing the necessary steel and other materials as well as labor. It is desirable, therefore, that the railroad managements should co-operate and render the maximum service possible with the present equipment.

The extent to which American refined tin is growing as a factor in the domestic market appears from the imports of tin ore. In 1913 these were practically nil, but in 1916 they grew to 8307 gross tons. The increase was over 100 per cent in the next three years, or to 17,139 tons in 1919. The rate for the 10 months preceding May, 1920, was 2000 tons per month, against 1428 tons per month in 1919. These receipts are mostly Bolivian ores which are smelted in the vicinity of New York and are refined electrolytically. The

results are significant not only as representing a new American industry, but also another important application of electro-chemistry to industry. While the output of American tin is insignificant as compared with the country's consumption, what has been achieved is gratifying, since hitherto tin was the only major non-ferrous metal that was not produced in the United States.

Union Responsibility Fixed

A decision handed down by the Supreme Court at Rochester, N. Y., last week by Judge Adolph Rodenbeck, states sound principles in a clear and vigorous manner. The decision upholds the contention of a clothing company which asserted that its employees were subjected to "verbal abuse, actual assaults and threats" and that its business was unlawfully interfered with by the Amalgamated Clothing Workers of America. The court made a temporary injunction permanent and allowed damages, the amount to be determined later. Although the decision relates directly to the clothing business, the principles enunciated would apply to any kind of manufacturing.

Judge Rodenbeck first set forth the relations of employers and employees to each other and to the public, saying:

> The plaintiffs were required to win their way in the world of business by hard and honest competition and by the character and quality of their goods; but the Amalgamated Clothing Workers, instead of endeavoring to secure recognition by an example of enlightened and reasonable administration in other factories, chose to force their way into plaintiff's factory by secrecy and by a strike backed by its powerful influence and supported by acts that the law condemns. Ultimate success in the labor movement does not lie along this line, but in the direction of a peaceful exemplification of a just and reasonable administration of affairs of the union, with advantages not only to employers and employees but to the public as well.

In other words, when a business has been built up by long years of honest effort, a labor union has no right to destroy it by unlawful acts, but the union must establish itself upon the basis of merit, if at all.

The court went on to show how the union in question, by its action toward another union which had been recognized by the clothing company, had been guilty of attempting to establish a monopoly of labor and the judge denounced economic and industrial despotism and monopolies, whether of labor or capital, as opposed to our principles of government.

In conclusion, the court emphatically set forth that a union cannot escape the consequences of its acts, if they are unlawful. "A concert of action by a labor organization and its members," said the judge, "to compel recognition of a union or to redress grievances by means of threats, intimidation, force, violence or similar coercive measures constitutes a conspiracy, whether such intention was present at the inception of the strike or afterward, and a national unincorporated labor union is liable for damages if its officers and agents acted within the scope of their authority as such in calling and carrying on the strike with the purpose of using such unlawful means; but the liability does not extend to the individual members who are not specially connected with such acts."

This decision shows that incorporation of a union is not necessary in order to hold it responsible for such acts as are here described. While an individual may not be compelled to share the liability unless there is evidence against him, the entire union as a body cannot escape responsibility for unlawful acts which if established against an individual would result in his punishment. The decision, although possibly more lenient than the one in the famous Danbury hatters' case as to the individual, is fully as rigid in establishing the responsibility of the union.

French Steel in 1919

The extent of the revival in the French steel industry is indicated by the 1919 statistics just published. These show how painful and to some extent disappointing is the process of recovery. The production of steel ingots and castings last year was 2,186,260 metric tons, or 46.6 per cent of the output of 1913, which was 4,686,866 tons. Of last year's total, 40 per cent, or 862,419 tons, was contributed by Alsace-Lorraine. It will be seen, therefore, that the pre-armistice steel districts of France produced last year about 28 per cent of their output in 1913. This performance would have been considerably improved had Germany delivered coal and coke as provided in the terms of the armistice.

While open-hearth steel continues to lead, having supplanted basic Bessemer steel during the war, it is to be noted that basic Bessemer is gradually coming back, the 1919 output, due to the contribution made by Alsace-Lorraine, having been nearly equal to the open hearth. The electric steel output last year, which was 42,500 tons, while not up to the forced production of war time, was twice that of 1913. The passing of crucible steel is indicated by the fact that the 1919 output was only two-thirds of that for 1913 and far below the war record.

French pig iron production in 1919 was 2,412,149 tons, of which Alsace-Lorraine contributed 1,112,443 tons, or 46 per cent. Electric smelting is a considerable factor, the year's pig iron output from electric furnaces amounting to 55,422 tons. While in the war period synthetic pig iron was produced electrically at a number of French works, the electric furnace product of 1919 was chiefly ferroalloys, the year's total of spiegeleisen, ferromanganese, ferrosilicon and other alloys amounting to 57,641 tons.

It is evident that the recovery of the iron and steel industry of France, as with that of Belgium or of Germany, will be much slower than was looked for in the hopeful days of early 1919. Railroad rehabilitation and increase of fuel supply must go hand in hand, and the day of effective transport in any part of Continental Europe is in the distant future.

Imports of iron ore into the United States have shown a surprising decline. It was to be expected that they would be small during the war,

but the falling off has continued since. Against over 200,000 tons per month in 1913, they fell to 80,000 tons per month in 1917 and to only 40,000 tons per month in 1919. Cuba furnished over 60 per cent of the 1913 imports and about 75 per cent of those in 1919, while Sweden's share in 1913 was about 14 per cent and last year 8 per cent. Iron ore exports, which are almost entirely to Canada, have remained about stationary. In 1913 they were 87,000 tons per month and in 1919 the average was 83,000 tons per month. The falling off in imports is concurrent with a decline in the Lake ore movement, indicating that blast furnace stocks may be drawn down to a new low point this year.

Coal Supplies

Two interesting suggestions of a trend "back to first principles" are afforded in the matter of coal movement. In the first place, there is the greatly increased use of the rivers in the Pittsburgh district for the movement of coal, and in the second place there is the rather liberal buying of railroad cars by interests engaged in the manufacture of by-product coke.

For several years the movement of coal by the Monongahela River appeared distinctly like a decadent industry. The vogue of the river in the earlier years of Pittsburgh coal development was chiefly in connection with the working of seams that outcropped on the valley, which was produced in geologic times by erosion. As the veins had to be penetrated farther and farther, interest in them decreased, and shaft mines with railroad connections undertook most of the service previously performed by mines with their river tipples. In recent years there has been a trend toward the river again, many short rail lines being built to carry coal to the river for water shipment. Particularly in the past three months, during the rail strike and the ensuing traffic congestion, there has been a much higher appreciation than ever of the facilities the rivers offer for coal transportation, and there has been feverish haste to repair old water craft as well as to build new barges.

The other movement is likewise a return, in a way, to first principles, for when railroads were first built in the United States it was a common thought that they would prove to be open highways for individual shippers, who would provide their own vehicles and means of locomotion. The idea did not "work" well, as it does on canals, and it was left chiefly to the railroads to provide cars as of necessity they provide locomotives. Private ownership of cars, however, did not down entirely, and in the case of coal at least the application of the private ownership principle is increasing.

There is an economic or business point to the private coal car as against the railroad owned car. Coal consumers differ in the urgency of their requirements, and in their ability to stand the cost of particularly good service. The railroad cannot afford, as freight rates go, to own a large number of cars that earn returns only for limited periods in the year. The private shipper may or may not be able to bear such an expense. If he is able, he has hopes of securing better coal delivery service by owning the cars. Obviously there should be at all times such regulations as would prevent the private car owner from causing the movement of coal to other consumers to be delayed by his operations. The function of the private car should be to increase the total movement of coal.

There is a curious reversal from the conditions existing until only a few years ago as to the relation of coal movement to general freight movement. The outstanding feature of the present traffic situation is that the moving of coal is too great a burden for the railroads and that in the interest of shippers generally it would be a good thing if the rails could be relieved of part of this burden. In the old days the case was precisely reversed. Many roads or branch lines were dependent upon coal transport for their success. They were practically built upon a coal movement, and once built they served shippers of other commodies who but for the coal movement would have had no rail facilities at all. It is a new situation due to the country having grown much more rapidly than the railroads have grown. The outstanding railroad trouble used to be that many roads did not have enough density of traffic. Now all that is observed is such density that the roads and terminals become congested. Time has brought new problems which we have been tardy in trying to solve.

Developments in Ferromanganese

Two facts stand out in the ferromanganese industry. One is an increase in output despite the falling off in pig iron production in April and May due to railroad labor troubles. In April and May, according to the blast furnace reports of THE IRON AGE, the ferromanganese output was 21,028 tons and 22,663 tons respectively, or larger than for any month in the first quarter and exceeding the average per month in 1919 by 6000 to 7000 tons. If the May and April output is maintained through the year and if imports from Great Britain hold up to the present average of 3000 tons per month, the available supply will about meet the theoretical demands of the industry at the present yearly rate of steel production, 41,500,000 tons.

The other interesting development is the reappearance of the electric alloy. There are now five companies producing ferromanganese in electric furnaces as compared with none in January. The present price is an incentive to the use of this process and there is the added advantage that ores high in silica can be more effectively treated in the electric furnace than in the blast furnace. There is also the fact that, as against only five blast furnaces producing ferromanganese in February, nine were so operating in May.

These results are gratifying as showing the recuperative powers of this essential industry. Under stress of war its achievements were memorable, and under peace conditions it bids fair to meet the situation, in spite of earlier unfavorable indications as to ore supply.

CORRESPONDENCE

"Cheese" Versus Multiple Ingots

To the Editor: In reference to the editorial which appeared in your issue of June 10, "Cheese vs. Multiple Ingots," I agree entirely with the position taken by you that the individual or cheese ingot is highly satisfactory for certain rolled product wherein the central portion containing the segregate is punched out or otherwise removed. Such ingots cannot, however, be commercially used in the production of rails as presented in the paper at the spring meeting of the American Iron and Steel Institute by C. A. Witter, and which method was abstracted in THE IRON AGE in the issue of June 3. I agree with your statement that a serious disadvantage, as suggested, is the large amount of space necessary for handling such ingots where the output is heavy.

You have, however, not touched on the other essential reason why such cheese ingots would not be adaptable for rails or for individual forgings. It should be remembered in all steel that there is a segregation of the metalloids during the process of solidification, which remain liquid for a longer period of time than the mother liquid and, consequently, rise toward the upper central portion of the ingot, be it a cheese ingot or an ingot of the usual elongated type. Some top discard is, therefore, essential, irrespective of the pipe section, in order to assure of a homogeneous structure of the usable part of the ingot. The depth* of the discard necessary in the elongated ingot to clear same of excessive segregation is approximately the same as that appertaining in the cheese ingot; thus, for a given tonnage of steel a considerably greater percentage of discard would be necessary in the small height cheese ingot than in the longer or multiple type ingot.

I am presenting my thoughts on this important subject as the present tendency toward economy in steel practice unquestionably lies in using dead-killed† instead of gassy steel, and in casting such steel in the multiple billet ingot with the large end up combined with a suitable hot top arrangement. With such mold practice 95 per cent sound, homogeneous steel free of pipe, blowholes and harmful segregation is obtainable, and such ingots will finish into 90 per cent, or better, of sound, homogeneous blooms, billets or sheets.

EMIL GATHMANN.

Gathmann Engineering Co., Baltimore, Md.
June 11, 1920.

*Per cent of volume + top segregation × period of solidification of entire ingot.
†Also termed solution steel, setting or solidifying without evolution of gases.

Employment in Industries in May

The Bureau of Labor Statistics of the U. S. Department of Labor received and tabulated reports concerning the volume of employment in May, 1920, from representative establishments and mines in 13 manufacturing industries and coal mining. Comparing the figures for May of this year with those of identical establishments for May, 1919, it appears that in 13 industries there was an increase in the number of people employed and in one a decrease. The largest increases are: 54.4 per cent in men's ready-made clothing, 24 per cent in woolen and 22.7 per cent in paper making. Cigar manufacturing shows a decrease of 7.5 per cent.

All of the 14 industries show an increase in the total amount of the pay roll for May, 1920, as compared with May, 1919. The most important increases are: 145.7, 77, 66.1 and 55.1 per cent which occur in men's ready-made clothing, paper making, woolen and hosiery and underwear, respectively.

In iron and steel the number of men on the pay roll in May, 1920, was 174,883 against 174,251 in May, 1919. The amount of the pay roll in 1920, however, was $13,399,616 as compared with $10,056,438 in 1919. In the automobile industry the number increased from 67,779 in May, 1919, to 79,833 in May, 1920, with an increase in the pay roll from $1,913,611 in 1919 to $2,748,766 in 1920. Car building and repairing employed 53,085 men in 1919 and 60,652 in 1920, while the pay roll advanced from $2,937,420 to $3,818,732 in 1920.

In comparison of the reports of the same industries for May, 1920, with those of April, 1920, four showed an increase in the number of persons on the pay roll and 10 a decrease. The greatest increase, 17.7 per cent, appears in car building and repairing. The 10 decreases range from 6.8 per cent in cigar manufacturing to 0.5 per cent in cotton manufacturing.

Seven of the fourteen industries reporting showed an increase and seven a decrease in the total amount of the pay roll in May, 1920, compared with April, 1920. Increases of 19.2 per cent, and 12 per cent are shown, respectively, in car building and repairing and paper making. The most important decreases are 4.4 per cent in coal mining and 4.2 per cent in iron and steel.

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German Steel Prices Down 8 to 15 Per Cent

Foreign Iron Ore Cut in Two—American Steel Prices Still Below the German Level—Export Duties Curtail Trade

(*Special Correspondence*)

BERLIN, GERMANY, June 2.—The upward wave of prices, which had been in full swing for more than a year, has at least broken at its crest. A certain weakening began several weeks ago, when old material began to drop, and this decline became very marked later. At the same time the German currency was steadily improving and reached such a point last week that foreign ores did not cost more than half so much as they did two months ago. It was clear, therefore, that the time had arrived for cutting down iron and steel prices generally. This was done two days ago at a meeting of the Iron Business League, as the new organization of the iron trade is called. The price changes appear from the following table, with comparative prices at three previous dates, all in marks:

	Before War	Dec. 1, 1919	May 1, 1920	June 1, 1920
Ingots	83.50	1430	2650	2435
Blooms	87.50	1465	2900	2655
Billets	95	1500	3125	2725
Slabs	97.50	1505	3200	2790
Structural shapes	112	1715	3620	3320
Bars	98–100	1745	3650	3200
Wire rods	117.50	2000	4150	3585
Heavy plates	105	2260	4700	4040
Medium plates	110	2545	5535	4775
Thin plates	125	3185	5600	4840

Heavy rails were reduced from 3,772 to 3,320 marks, and mining rails from 3,752 to 3,300 marks. To all these prices 100 marks must be added for products made of open-hearth steel. This margin was reduced from 150 marks. The new prices took effect June 1.

Little Change in Pig Iron—Scrap Much Lower

An effort was also made to effect a general reduction of pig iron prices, but at first with only partial success. Hematite and steel making grades low in copper were reduced by 185 marks, but other irons were left unchanged against the protest of the Government's representative. He was sustained in his opposition by the workmen's representatives of all three classes (production, trade and consumers). The Government's objections were based not upon the fact that a change has occurred in the general business situation, but upon the two facts that an investigation undertaken by the Ministry showed that a reduction was called for, and particularly that the improvement in the currency had caused a great reduction in foreign ore prices. The refusal of the league to make further reductions was sharply criticised in the press and by consumers.

Under these circumstances the Government has just announced a more general reduction. For June and July the reduction on hematite and steel making grades will be 200 marks; on foundry iron, 50 marks; on 50 per cent ferromanganese, 570 marks; on 10 per cent ferrosilicon, 200 marks. Siegerland pig and spiegeleisen were left unchanged. The Siegerland ore producers have decided to leave June prices unchanged, but subject to any change in wages or fuel.

The reduction in waste, scrap and old iron already referred to has been very heavy, and it has extended along the whole line. The highest grade of old material, which had reached 2,800 marks and more above a month ago, is already offered at 800 to 900 marks; and it is probable that purchases are being arranged at even lower terms. First-class turnings, which had risen to 2,500 marks, are now offered at 800 marks or lower. It is said that these drops in prices have brought not a few firms into great financial difficulties.

Further Price Cuts Expected

While it is a risky thing to make predictions in times like these, when the value of the mark fluctuates violently from day to day, it may at least be asserted that conditions appear favorable for further reductions in prices. The general movement in other lines than iron is now downward; and buying is on an extremely restricted scale. The disinclination to buy has grown so pronounced that the newspapers are saying that consumers have gone on a strike. In not a few branches of manufacture, too, this change in the general business situation has already been so sharply felt that some concerns have had to shut down and others have had to discharge workmen on a large scale or reduce the working time. While this is not yet the state of things in the iron trade, still a reaction begins to make itself felt. Manufacturers are said to be watching general developments with considerable anxiety; and in the Ruhr district it is reported that new buying is on a very restricted basis. On the other hand, producers are offering goods more freely than hitherto, and in half-manufactured steel an unusually quiet business is reported. Consumers are now placing orders only for their immediate requirements.

American Steel Below German Prices

Owing to several causes a marked reduction in foreign business has taken place. The improvement in the currency has had the effect that German prices now work out, on most classes of goods, higher than the American. Lists of comparative prices have just been printed in the press showing remarkable differences between American and German prices. Billets here are quoted at 3,125 marks, while the American price is worked out at 2,100 marks. Similarly heavy plates at 4,700 marks (before the reduction mentioned above), against 2,940 marks for American; thin plates at 5,625 marks, against 4,300, and rails at 3,700, against 1,920. On the other hand, English prices are still above the German. The comparisons here mentioned are on the basis of foreign exchange on May 25.

Export Duty Cuts Down Shipments

Another cause is the export duty that the Government has been collecting. This amounted to 10 per cent on bars for May. This tax, it is claimed, has had a remarkable effect in reducing exports, and producers have been holding meetings of protest against it. The Business League has reached an agreement that the total exports of iron and steel must not exceed 20 per cent of the production of crude steel by the various works in February.

The export duty has been felt with special severity in the hardware and cutlery trade, which is also hard hit by the improvement in exchange. Already many foreign orders have been canceled, especially from countries whose currencies are nearer the German level, like France and Italy; and hardly any new foreign orders are coming in. The manufacturers complain that the high rates to which wages have been driven have also tended strongly toward curtailing their foreign business; and whereas foreign exchange rates have fallen by more than half, wages remain unchanged or are still going higher.

Owing to the improvement in exchange the French authorities have ordered that steel products shipped from the Saar district into France must be sold in French currency; whereas they compelled manufacturers to sell in German currency when the mark was much lower than it is to-day. At the same time they must sell at the prices prevailing in France, which means about 1,000 marks a ton less on bars than they have been getting. The Saar works, by the way, are already in an unusually unfavorable situation, the

causes of which cannot be described here in detail. It was mentioned some three weeks ago that orders were being canceled there on a very large scale.

Ore Movement Better

The ore situation has improved within a month or two, owing chiefly to better arrivals from abroad. Hitherto the German furnaces had been depending entirely upon Sweden for their supplies of foreign ores, but latterly Spanish ores have begun to come in again, and considerable amounts are also arriving from Algiers, Greece and Portugal. Moreover, ores have latterly been coming in by way of Holland, with further shipment by barge on the Rhine, whereas all shipments up to a month or two ago had been by German North Sea ports. Spanish ores in particular are being offered in heavy amounts; and as the freight rates on these have recently been reduced from 40 to 30 shillings the ton they are finding a readier market. Nevertheless, as all these foreign ores arrive in foreign vessels, and as the freight rates are still fully as high as the price of the ores themselves, the German furnaces are still handicapped by having to meet such large payments abroad in the depreciated German currency, notwithstanding its recent improvement.

On the other hand, the arrivals of minette ores from Lorraine and Luxemburg have remained quite unsatisfactory. This apparently grows out of the failure, or perhaps the inability, of the Germans to supply the French with the stipulated quantities of coal and coke. A fortnight ago it was reported that nine-tenths of the furnaces in Lorraine and in the Moselle and Muerthe valleys had been compelled to bank owing to the non-arrival of German coke; and for that reason shipments of ores into Germany were ordered discontinued. On the other hand, a French publication now reports that a new agreement has been made under which France will ship 200,000 tons of minettes into Germany in June and a similar quantity in July in payment for coke to be delivered from the Ruhr. Several days ago it was reported that some of the furnaces in Luxemburg formerly owned by the Germans have again been blown in owing to better arrivals of coke, which comes partly from England.

Scarce Coke Limits Pig Iron Output

The production of pig is at a rather low ebb, the total amounting to only about one-third of the ante-war level. The furnaces are inadequately supplied with coke, and here the explanation is offered that this is due to coke deliveries to France. The demand for pig, however, remains very heavy, and no traces of the reaction mentioned above has been observed in this product. From the Silesian district great scarcity of pig is reported; there are no supplies at the furnaces, and new iron goes immediately into consumption. What makes matters worse, a number of the furnaces in that district are out of blast owing to lack of coke. Other sections of the trade in that district are working under great pressure. Especially heavy is the demand for plates, both thick and thin, and periods of delivery run as long as 18 months.

German Companies Reaching Out

It is now announced that the French company that acquired a 60 per cent interest in the Mannesmann's branch plant in the Saar district is the Société Métallurgique de Montbard-Aulnoye. This company has its head office at Paris and operates a tube plant at Montbard and one at Aulnoye. The Stumms, already mentioned in this correspondence as having also sold a large part of their interests on the Saar, continue to pick up other connections elsewhere. It is now mentioned that they have made a deal with the Gussstahlwerke Witten in the town of Witten.

Deutsch-Luxemburg also continues to make new alliances. It has just effected a 10-year arrangement with the Friedrich Thomé Co. of Werdohl under which it is to deliver half-rolled steel, coal and other material to that company, at the same time guaranteeing it a fixed net profit. It has made a similar arrangement with the Stahlwerke Brüninghaus of the same town. Deutsch-Luxemburg is also negotiating a community-of-interest arrangement with the Carl Berg Co. of Eveking, which is an aluminum producing establishment.

Krupp is apparently succeeding in enlarging the basis of its operations. It has recently given notice of its intention not to renew the rental of some of its unused shops to the city of Essen, but will employ them in new branches of production which it has taken up. The company now has 48,000 employees at its Essen shops, compared with 39,000 in the last year of the war.

The report mentioned in my last letter about an amalgamation of Deutsch-Luxemburg and Gelsenkirchen is now denied, although it is admitted that conferences have been held.

Earnings in 1919

The Eisenwerk Kraft, which operates a furnace plant at Kratzwieck near Stettin and another with a steel plant on the lower Rhine, reports gross earnings of 10,660,000 marks for last year, comparing with 2,336,000 marks for 1918. But the dividend was left unchanged owing to increased expenses and interest charges and a greater write-off.

The Ludwig Loewe Co. of Berlin, known to the American machinery trade as the chief German manufacturer of machine tools on American models, reports gross profits of 8,391,000 marks, comparing with 6,714,000 marks for 1918. But owing to very heavy increases in expenses the net profits were less, and the dividend was reduced from 20 to 18 per cent. The report points out that while the turnover was several times greater than in peace times the actual quantity of product was only about half as great.

Industrial Cost Accountants Organize

The Industrial Cost Accountants' Association was organized in Chicago, June 18, by representatives of leading manufacturers in various lines of industry.

The object of the new association is the standardization of accounting and cost terminology and the adoption of standard governing principles; the promotion of active co-operation and interchange of experiences between representatives of manufacturers engaged in similar activities; the education of the members and their business associates in the complex economic problems of industry; to assist standardization committees in each line of industry in establishing uniform accounting and cost practices, and to act as a clearing house in distributing to all members the development in cost practices to the end that uniformity, once established, may be maintained.

Applicants for membership must be placed in nomination by an industrial firm or corporation, or trade organization, which must certify that the proposed member is either the owner, an officer, or a permanent employee actively engaged in the supervision of costs in such firm or corporation, or trade organization. Persons are not eligible to membership who are engaged professionally in the public practice of cost accounting on their own account, or in the employ of others so engaged. The annual dues are $25.

The industries represented in forming the association were the electrical, tanners (13 divisions), gear, brick, confectioners, concrete pipe, air brake, sand and gravel, farm operating equipment, cotton fabric, baking, concrete products, laundry, gas engine and window glass manufacturers.

M. F. Simmons, Schenectady, N. Y., supervisor of costs for all General Electric Co. interests, was elected president of the association; C. H. Smith, of Wilmerding, Pa., director of clerical operations of the Westinghouse Air Brake Co. interests, first vice-president; Roland H. Zinn, of New York, chief of the Cost Accounting Bureau of the Tanners' Council, second vice-president; A. A. Alles, Jr., Pittsburgh, secretary Fawcus Machine Co. and treasurer the Schaffer Engineering & Equipment Co., secretary-treasurer of the new organization. Headquarters will be in Pittsburgh, at the office of the secretary-treasurer, 1501 People's Bank Building.

Iron and Steel Markets

STEEL SHIPMENTS LESS

Fuel Supply Shows No Improvement and Coke Is Higher

Basic Pig Iron Advancing, But Plates and Shapes Are Easier

Iron and steel producers are still traveling in a circle, betterment in car and fuel supply being quickly followed by a return of old conditions. This week the breaking out of fresh railroad strikes at Philadelphia and Baltimore has crippled several Eastern steel plants, and embargoes against the affected districts have been put in force at Pittsburgh.

Fuel shortage has driven some pig iron producers to pay new high prices for coke and $17 has been reached in the dizzy ascent of that market. Basic pig iron also tends higher. On the other hand are easier prices in plates and shapes; but with little promise of better than 75 or 80 per cent production for many weeks, no significant readjustment of finished steel prices is looked for.

Many manufacturers who buy pig iron or finished steel are still in sore straits for lack of raw material. Some of them are getting only a fourth or a third of normal shipments and cannot understand where all the steel goes.

The Commerce Commission's new order that all coal cars be sent empty to the mines, whereas previously 50 per cent had been held for reloading with other freight, has been a fresh hardship to steel mills. Thus in many cases steel shipments have fallen off in the past few days.

It is evident that while ingot production holds up well, a good many steel mills are stocking a considerable part of their product in the form of slabs, or billets or skelp. But this means in time a cramping back on open-hearth and blast furnace departments.

The buying of steel cars by steel and coke companies goes on. In the past week such new inquiries involved 2700 cars and one car works took orders for 1500.

Further conference is expected on the sheet and tin plate scale between the Amalgamated Association and independent producers before June 30, but a shut-down is not unlikely. The workers have withdrawn the proviso for a 6-hour turn, in view of the labor scarcity. They insist, however, on retaining the paragraph providing that the union may present wage scales for employees in departments not now organized, who may become union men within the scale year. The mills stoutly oppose any extension of the closed shop whether by Amalgamated Association or by the Federation of Labor.

In the case of bar iron mills, the recent failure to agree will not involve a shut-down in any event before July 31, or one month later than the limit for sheet and tin plate mills.

The possibility of a sheet and tin plate shut-down June 30 has led to recent resales of sheet bars, some Bessemer bars having been offered at $65 to $70 and open-hearth bars at less than $75, representing some easing off.

More activity in pig iron is reported in some centers, especially in Cincinnati in malleable and in basic at Pittsburgh. An example of the unusual action necessitated by railroad conditions is the buying by a central Ohio steel plant of basic pig iron at Ashland, Ky., on a basis equivalent to $45, Valley. This company usually obtains its iron from Cleveland, but has been unable to do so of late. A Detroit company which recently blew in a new furnace is offering for resale a considerable tonnage for which it had contracted, but full prices are being asked. Inquiry for export includes some very large tonnages of both foundry and basic grades. Most of the inquiries are sent out by brokers and it is not expected that they will result in an export movement of importance.

A new development in the coke market is the inquiry coming from South American and European sources, including one for 10,000 tons per month for 18 months. Owing, however, to the shortage in this country and to the very high prices, it is not expected that exports will be heavy. Although sales of prompt foundry and furnace coke are reported at from $16 to $17, Connellsville ovens, contracts for furnace coke have been made at $11.50. These contracts include one with an Eastern consumer for 2500 tons per month and one with a Western consumer for 5000 tons per month for the last half of the year.

Both producers and consumers of Lake Superior iron ore will make a hard fight on the increase of 22c. the railroads ask in the ore rate from lower Lake ports to interior blast furnaces. There is also an effort, started by a Pittsburgh steel company, to have a part of the ore freight increase apply to rates from the iron mines to upper Lake ports, so that Lake front furnaces would have to bear part of it. Ore producers oppose this plan, as it would increase mine royalties which are based on the price of ore delivered at Lake Erie dock.

Ore transportation, from the standpoint of car supply at lower Lake Erie ports, has grown worse and the shortage of cars is more acute than at any time in the history of the ore trade.

Pittsburgh

PITTSBURGH, June 22.

For various reasons the local railroad situation this week is not as favorable as last week. The outlaw strike among the switchmen and other railroad employees in the East has resulted in the Baltimore & Ohio and the Pennsylvania railroads placing embargoes on all shipments into Philadelphia and Baltimore, while the Philadelphia & Reading has also declared an embargo on Philadelphia and Baltimore and to all points east of those two cities. To make the situation worse, the Interstate Commerce Commission has just issued what is known as service order No. 7, which requires that all coal-carrying cars shall be placed at the mines of coal loading railroads to 100 per cent instead of 50 per cent as heretofore. All railroads not serving coal mines shall deliver all coal carrying cars, when empty, to the coal loading railroads. This order applies to all railroads east of the Mississippi River and means that all manufacturing concerns heretofore receiving carload shipments of coal must return the empty cars to the railroads and they will not be permitted to load them. This will work an additional

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 22, 1920	June 15, 1920	May 25, 1920	June 24, 1919
No. 2 X, Philadelphia‡	$47.15	$47.15	$47.15	$29.50
No. 2, Valley furnace†	45.00	45.00	45.00	26.75
No. 2, Southern, Cin'ti†	45.60	45.60	45.60	28.35
No. 2, Birmingham, Ala.†	42.00	42.00	42.00	24.75
No. 2, furnace, Chicago*	43.00	43.00	43.00	26.75
Basic, del'd, East. Pa.	44.80	44.80	44.80	25.50
Basic, Valley furnace	44.00	44.00	43.50	25.75
Bessemer, Pittsburgh	44.40	44.40	44.40	29.35
Malleable, Chicago*	43.50	43.50	43.50	27.25
Malleable, Valley	44.00	44.00	44.00	27.25
Gray forge, Pittsburgh	44.40	43.40	43.40	27.15
L. S. charcoal, Chicago	57.50	57.50	57.50	38.85
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$55.00	$55.00	$55.00	$45.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	47.00
Bess. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. sheet bars, P'gh.	75.00	80.00	80.00	42.00
Forging billets, base, P'gh.	85.00	85.00	80.00	51.00
O.-h. billets, Philadelphia	64.10	64.10	64.10	42.50
Wire rods, Pittsburgh	75.00	75.00	75.00	52.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.25	4.25	4.25	2.595
Iron bars, Pittsburgh	4.25	4.25	4.25	2.35
Iron bars, Chicago	3.75	3.75	3.75	2.50
Steel bars, Pittsburgh	3.50	3.50	3.50	2.35
Steel bars, New York	4.02	4.02	4.02	2.62
Tank plates, Pittsburgh	3.50	3.50	3.75	2.65
Tank plates, New York	3.77	3.77	4.02	2.92
Beams, etc., Pittsburgh	3.10	3.10	3.10	2.45
Beams, etc., New York	3.27	3.27	3.27	2.72
Skelp, grooved steel, P'gh.	2.75	2.75	2.75	2.45
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	2.65
Steel hoops, Pittsburgh	5.00	5.00	5.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	June 22, 1920 Cents	June 15, 1920 Cents	May 25, 1920 Cents	June 24, 1919 Cents
Sheet, black, No. 28, P'gh.	5.50	5.50	5.50	4.35
Sheets, galv., No. 28, P'gh.	7.00	7.00	7.00	5.70
Sheets, blue an'l'd, 9 & 10.	4.50	4.50	4.50	3.55
Wire nails, Pittsburgh	4.00	4.00	4.00	3.25
Plain wire, Pittsburgh	3.50	3.50	3.50	3.00
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.10
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	$35.50	$35.50	$37.00	$22.50
Carwheels, Philadelphia	38.00	38.00	40.00	23.00
Heavy steel scrap, P'gh.	25.00	25.00	25.00	17.50
Heavy steel scrap, Phila.	23.00	22.50	23.00	17.00
Heavy steel scrap, Ch'go.	23.00	22.50	22.50	17.00
No. 1 cast, Pittsburgh	32.00	32.00	32.00	19.00
No. 1 cast, Philadelphia	37.00	37.00	37.00	22.00
No. 1 cast, Ch'go (net ton)	35.50	35.50	36.50	21.00
No. 1 RR, wrot, Phila.	33.00	33.00	33.00	22.00
No. 1 RR, wrot, Ch'go (net)	25.00	25.00	25.50	17.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	17.00	$15.00	$14.00	$4.00
Furnace coke, future	11.50	15.00	14.00	4.00
Foundry coke, prompt	17.00	16.00	15.00	4.75
Foundry coke, future	16.00	16.00	15.00	5.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	19.00	19.00	19.00	18.50
Electrolytic copper, N. Y.	19.00	19.00	19.00	18.25
Zinc, St. Louis	7.45	7.55	7.60	7.00
Zinc, New York	7.80	7.90	7.95	7.35
Lead, St. Louis	7.90	8.50	8.15	5.15
Lead, New York	8.15	8.75	8.50	5.40
Tin, New York	50.00	45.50	51.00	70.00
Antimony (Asiatic), N. Y.	7.75	7.87½	9.25	8.37½

The above prices are for domestic delivery and do not necessarily apply to export business.

hardship against iron and steel shipments. Nearly all the leading steel companies report that their shipments have fallen off the last few days, and the outlook for betterment is very discouraging. The Pennsylvania Railroad handled on Monday 59,000 loaded cars in the central region. Shippers say these cars are not being moved to any extent, but are pushed into yards and on sidings, and there they stay. The Baltimore & Ohio and the Pittsburgh & Lake Erie report about the same conditions as last week, but the heavy lightning and rain storms recently have greatly interfered with the movement of cars and many of the men have quit work. The delay of the National Railroad Board at Chicago in making a decision on the wage question for switchmen and others is severely criticized here, shippers stating there is no good reason why the board cannot hand down its decision at once, giving the men a partial amount of the advance they asked, as this would certainly result in many of the men going back to work.

There has been a good deal of activity in the past week in basic and foundry iron, and sales of basic have been made by furnaces outside the Valleys that figure somewhat higher than $44 at Valley furnace. There is a heavy demand for prompt furnace coke, some furnaces being in distress for coke and willing to pay almost any price for it rather than close down. On Monday prompt furnace coke sold at $16, but on Tuesday $16.50 and $17 were paid, and the latter very high price was offered by the buyer for more coke without getting it. The supply of cars at the coke plants is still very light, running from 10 to 25 per cent.

The demand for finished steel is only fair, but there is no pressure on the part of mills to sell, and prices are holding firm. It will take two to three months or longer to move the heavy stocks of finished steel piled in mill yards and warehouses and loaded on cars, and consumers are not likely to be active buyers until they receive a good part of the material still due them on old contracts. A shortage in labor is developing, and this is affecting very seriously operations of finishing mills. A leading tin plate interest closed last week three of its plants on account of inability of the railroads to deliver steel.

Pig Iron.—It is stated that close to or all of $45, Valley furnace, could easily be obtained for basic iron from consumers who are in distress for it. One central Ohio open-hearth steel plant has paid the equivalent of $44.40 for 1700 tons of basic, and the equivalent of $45, Valley furnace, for 2000 tons of basic, the latter iron coming from Ashland, Ky. Ordinarily this plant gets its iron from Cleveland furnaces owing to a low rate of freight, but the railroads are unable to deliver it from Cleveland and the company has had to go out and buy iron wherever it could find it in preference to closing down its plant. Prior to building its new blast furnace at Detroit, the Ford Motor Co. had a good deal of iron due it from various producers, but now that this company has started one of its furnaces, it is offering this iron for resale, but the prices quoted are considerably higher than the $45 basis for No. 2 iron. Some of the iron is to come from Buffalo, some from Virginia and other places, and it is not expected to effect prices for local iron, and, if bought, will help out, to some

extent, the shortage of pig iron at some consuming points, due to the railroad strike. A sale of 500 tons of forge iron is reported at about $43, Valley furnace. There is a brisk inquiry for small lots of foundry iron which readily brings $45 at Valley furnace for No. 2 iron. Bessemer is very strong at $43, Valley furnace, and we note a sale of 500 tons at that price.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being $1.40 per gross ton:

Basic	$44.00
Bessemer	43.00
Gray forge	43.00
No. 2 foundry	45.00
No. 3 foundry	43.50
Malleable	44.00

Billet and Sheet Bars.—The failure to effect a settlement of the sheet and tin plate mill wage scales at Atlantic City recently makes possible a shutdown of the sheet and tin plate mills that sign the Amalgamated scale after June 30, and for this reason several of the mills that have sheet bars coming to them are offering at least part of these bars for resale on the open market. It is said that Bessemer sheet bars have been offered at $65 to $70, and open hearth bars at about $75, maker's mill. A sale of 1000 tons of Bessemer sheet bars is reported at about $65 and 1200 tons of open-hearth bars at $75 or under. Youngstown steel mills are now reported to be operating at close to 80 per cent of capacity, but shipments are less than production. Local steel mills are running at 85 to 90 per cent, and shipments to some important consuming centers are nearly normal, but to others are practically tied up.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $38 to $60; 2 x 2-in. billets, $42; Bessemer sheet bars, $42 to $65; open-hearth sheet bars, $42 to $75, and forging billets, ordinary carbons, $85 to $90 base, all f.o.b. Youngstown or Pittsburgh mill.

Ferroalloys.—Very little is being done in the local alloy market, consumers being well covered, but shipments are very unsatisfactory. There have been some sales of silvery iron at slightly higher prices than have ruled recently. Domestic 80 per cent ferromanganese is easier for prompt shipment, and on a firm offer could be obtained at probably $225 per gross ton delivered.

We quote 76 to 80 per cent domestic ferromanganese $200 for last half and $230 to $240 for prompt delivery, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $80 to $85 and 18 to 22 per cent spiegeleisen at $70 to $75, furnace. Prices on Bessemer ferrosilicon are: 9 per cent, $60.50; 10 per cent, $63.50; 11 per cent, $66.80; 12 per cent, $70.10. We quote 6 per cent silvery iron, $53; 7 per cent, $54.50; 8 per cent, $56.50; 9 per cent, $58.50, and 10 per cent, $61. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Structural Material.—The local market is very quiet on inquiry and very few jobs are being placed. The American Bridge Co. has taken a railroad bridge, 300 tons, but no other local jobs are reported. Prices on plain steel are easier and several mills report they have less work ahead of them than for some time. The Carnegie Steel Co. is still quoting beams and channels up to 15 in. at 2.45c., one other fabricator is quoting 2.90c. to 3.25c., while another mill that has been holding plain steel at 4c. is now quoting 3.50c. at mill, or lower.

Plates.—Very few inquiries for cars came out in the past week, but local steel car companies report they are figuring quietly on 2000 to 3000 steel hoppers for steel companies and coke producers who have decided to build their own cars and thus be assured of a supply when needed. The Cleveland, Cincinnati, St. Louis & Chicago Railroad has an inquiry with local car builders for 2000 box cars. The demand for plates is not as urgent as some time ago, and some mills that have pretty nearly cleaned up accumulated orders are seeking business more actively. Most of the demand is from the ship building interests, but even this is not as heavy as some time ago.

We quote sheared plates of tank quality, ¼-in. and heavier, at 2.65c. to 3c. for very indefinite delivery, while prices on ¼-in. and heavier plates named by mills that will agree to ship out in three to four months, is 3.50c.

Sheets.—Still further betterment has been made in the past week in operation of sheet mills by the American Sheet & Tin Plate Co. and also the independent mills. The demand is fairly heavy, but is not nearly so urgent as some time ago. Most mills are pretty well covered over last half of the year, and the heavy accumulation of stocks of sheets, piled up on account of the railroad strike, is being reduced very slowly. Sheet mills in the Youngstown district are operating better now than at any time since the railroad strike started. The range in prices on sheets of the leading interest and the independent mills is steadily getting narrower.

We quote No. 28 gage box annealed one-pass black sheets at 4.35c. to 6.50c.; No. 28 galvanized, 5.70c. to 8.50c., and Nos. 9 and 10 blue annealed at 3.55c. to 6c., the lower prices named being the March 21 schedules, which are still named by the leading interests, while the higher prices represents a fair range of quotations by the independent mills.

Tin Plate.—This is the dull season in the tin plate trade, consumers being covered for this year, and practically no new orders are being placed. Operations of the mills are fairly good, and two or three of the leading independent mills report that, while they are operating practically normal, they are not producing more than about 75 per cent of normal output. This is due largely to scarcity of labor and to the skilled workmen failing to report for duty very often. The failure to fix up the tin plate scales for the union mills may result in these plants closing on June 30, when the present scale expires. Export demand is fairly active, and it is said as high as $11 per base box has recently been paid for export tin plate.

We now quote tin plate to domestic consumers for remainder of the year delivery at $7 to $8.50 base box, stock items $9, and for export $11 to $12 per base box, all f.o.b. Pittsburgh.

Steel Rails.—One mill rolling light rails that reported some time ago it was practically filled for the remainder of this year is now said to be willing to take on some tonnage for delivery in the last quarter. The re-rolling mills report they are taking a fair amount of new business. There is little activity in standard sections.

The Carnegie Steel Co. is still quoting the March 21, 1919, prices, these being 2.45c. for 25 to 45-lb. sections, 2.49½c. for 16-lb. and 20-lb. sections, 2.54c. for 12-lb. and 14-lb. sections, and 2.58½c. for 8-lb. and 10-lb. sections. This company is also quoting standard sections 50 lb. and heavier at $45 for Bessemer and $47 for open hearth stock. The Cambria Steel Co. is quoting 25-lb. to 45-lb. sections at 3.75c., 16-lb. and 20-lb. sections, 3.79½c., and 12-lb., 3.84c. at mill, for such delivery as it can make.

Wire Rods.—The demand is still very active. A local mill has sold 500 tons of soft open-hearth rods at $75 and 300 tons of high-carbon rods at $85, at mill. We continue to quote soft Bessemer and open-hearth rods at $75, screw stock rods $80 to $85 and high-carbon rods $85 to $100, depending on the carbon content.

Wire Products.—Two local mills are now allocating their output of wire and wire nails, and say it is working very satisfactorily. The demand for wire and wire nails is heavy for this season of the year and for cement-coated nails is very active, prices on these being $3.60, base, per keg. Export orders for wire nails are $5.75 to $6, base, plain galvanized wire 5.50c. to 5.75c. and galvanized barbed wire about 6c., at mill. Prices on wire products of the independent mills are given on page 1833.

We quote wire nails at $3.25 base, this being the price of the American Steel & Wire Co., and $4 base on the new card recently issued by four or five of the independent mills. We quote bright basic wire at $3, this being the price of the American Steel & Wire Co., and $3.50, this being the price of most of the independent mills.

Cotton Ties.—It is stated that the Carnegie Steel Co. has already sold the greater part of its output of cotton ties for this season at its announced price of $2 per bundle of 45 lb., at mill. The Pittsburgh Steel Co. has not yet announced its price.

Iron and Steel Bars.—The demand for reinforced steel bars for concrete work is reported by the mills to be lighter now than for some months, due very largely to the general falling off in building operations. Very heavy stocks of iron and steel bars are piled at

the mills, and the Duquesne Steel Works of the Carnegie Steel Co., where this company makes most of its steel bars, is running light, owing to the railroad strike. The demand for both iron and steel bars is fair, but prices quoted by independent mills are easier.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 3.50c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active, and we quote these, when rolled from billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c. and refined iron bars at 4.50c. to 5c. in carloads, f.o.b. mill, Pittsburgh.

Cold-Rolled Steel Bars.—Shipments of two local makers of cold-rolled steel bars are still being made largely by truck, going as far west as Detroit, and as far east as Hartford, Conn. The demand for small sizes of cold-rolled bars, for 1-in. up to 2-in., is active, but for the larger sizes is light. We quote cold-rolled steel bars to regular customers at $4.10 to $4.25 per 100 lb., at mill, for such delivery as producers can make. Several of the smaller makers are still quoting cold-rolled steel bars at 5c., at mill, and state this is their minimum price.

Cold-Rolled Strip Steel.—The demand is only fairly active, but local makers say they have covered their customers over the last half of the year. Shipments are very light, and a good deal of material is still being delivered by truck. Prices of two leading local makers are firmly held at 8½c. per lb. at mill.

Hot-Rolled Strip Steel.—The demand has fallen off a good deal. Most consumers are covered, but are getting very light shipments, owing to the railroad strike. We quote hot-rolled strips at 5½c. per lb. at mill, to regular customers only. Premium prices are largely disappearing and range from 6c. to 8c. at mill.

Nuts, Bolts and Rivets.—Another local maker has made an advance in prices on most grades of nuts and bolts of about 10 per cent. The demand is active and makers are now covering their trade for the last half of the year. Heavy shipments are still being made by truck, consumers being willing to pay the carrying charges to get the material. Discounts on nuts and bolts, and prices on small and large rivets are given in detail on page 1833.

Spikes.—A very active demand from the railroads for standard spikes has developed recently. The Delaware & Hudson is in the market for 3000 kegs, the Erie for 8000 kegs and smaller inquiries from other roads total about 2000 kegs. Makers report the demand for small spikes is very heavy and for boat spikes fairly active.

We quote standard spikes, ½ to 9/16 in. and larger, $4 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅜ in. and 7/16 in., $4.50; 5/16 in., $5.00; boat and barge spikes, $4.25 f.o.b. Pittsburgh. Tie plates $3 to $4 per 100 lb.

Iron and Steel Pipe.—The heavy premiums offered by jobbers and others for quick delivery of iron and steel tubular goods, which have been a feature of the market for so many months, are said to have largely disappeared, probably mostly for the reason that consumers and jobbers making these offers found the mills would not accept them. For some time jobbers and consumers of iron and steel pipe, unable to get delivery from their regular sources of supply, have made offers to other mills to place a specified tonnage each month over a period of a year or two with these mills, if they will agree to give them a certain tonnage and guarantee quick delivery. This shows very conclusively the difficulties under which some jobbers and consumers are operating and their keen desire to get supplies. All the mills rolling iron and steel tubular goods are still turning away a great deal more business than they are entering, and it is said the mills will entertain offers of business only from regular customers, and for such delivery as they can make. A report has been current here of an impending reduction in prices on some lines of iron and steel pipe, but this is incorrect. Shipments are reported by mills to be getting better, due to the improved railroad situation. Discounts on iron and steel pipe are given on page 1833.

Coke.—There has been a flurry in prices on furnace and foundry coke, and since our last report sales of standard grades of furnace and foundry coke have been made at $16 to $17 per net ton at oven. On Monday, June 21, several offers of $17 for furnace coke were made without getting it. A leading coke interest reports that it has recently made a contract with an Eastern consumer for 2500 tons of furnace coke per month, and with a Western consumer for 500 tons per month for last half of the year, both at $11.50 per net ton flat, at oven. The same company reports it is offered another contract for 5000 tons per month over last half of this year, at $11.50 flat at oven, but does not have the coke to spare. There is a very acute shortage in supply of furnace coke for prompt shipment, which accounts for the high prices ruling. Output of coke in the upper and lower Connellsville regions last week was 185,230 net tons, a decrease from the previous week of 4000 tons. Two sales of prompt furnace coke at $16.50 net ton at oven are reported, one of 50 cars and one of 100 cars also 80 cars at $17. We quote blast furnace coke for prompt shipment at $17, and on contracts for last half of the year, $11.50 to $12 per net ton at oven. At present foundry coke is selling at about the same prices as furnace.

Hoops and Bands.—Inquiry is active and one local mill has been selling hoops and bands freely for some time on the basis of 5.50c. at mill, usual extras. The Carnegie Steel Co. is still quoting 3.05c. on hoops and bands, this being the March 21, 1919, price. The plant of the Sharon Steel Hoop Co., Sharon, Pa., maker of hoops and bands, is again in operation to nearly normal capacity.

Old Material.—The local scrap market continues extremely quiet, and prices are showing some signs of receding. Selected heavy steel scrap, which sold about a week ago at $26, delivered, is now freely offered at $25.50, and possibly $25 would be accepted on a firm offer. Borings and turnings are off fully $1 per ton, and there is no demand for either. Deliveries of scrap to consumers are better, and as most consumers still have considerable scrap due them on old contracts, they are not expected to be active in the market as buyers until they have received a good part of the scrap still due them on these old contracts. A leading consumer in this district is offering only $16 for borings and not over $14 for turnings, but will buy only a limited quantity at these prices. We have reduced prices on several grades of scrap from 50c. to $1 per ton.

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates, as follows:

Heavy melting steel, Steubenville, Follansbee, Breckenridge, Monesen, Midland and Pittsburgh, delivered	$25.00 to $25.50
No. 1 cast for steel plants	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	31.00 to 31.50
Compressed steel	22.00 to 22.50
Bundled, sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	15.50 to 16.00
Bundled, sheet stamping	14.50 to 15.00
No. 1 busheling	17.50 to 18.00
Railroad grate bars	26.00 to 26.50
Low phos. melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	29.00 to 29.50
Railroad malleable	30.00 to 30.50
Iron car axles	37.00 to 38.00
Locomotive axles, steel	34.00 to 35.00
Steel car axles	31.00 to 32.00
Cast Iron wheels	40.00 to 41.00
Rolled steel wheels	29.00 to 30.00
Machine-shop turnings	14.00 to 14.50
Sheet bar crop ends (at origin)	28.00 to 28.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	32.00 to 32.50
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought	31.00 to 32.00

New York

NEW YORK, June 22.

Pig Iron.—Interest in the market still centers largely in inquiries for export which now include 80,000 tons of basic and 20,000 tons of foundry. Details as to the inquiries, especially as to the countries from which they come, are not made public, and it is not believed that contracts for these large tonnages will be made. There is also a new inquiry for 5000 tons of foundry iron for Glasgow, to which city a considerable tonnage has been shipped during the past two weeks. Inquiries and sales from domestic users have been slight, but prices remain firm. In fact, one furnace company in Tennessee, which has been quoting on a basis of $42, Birmingham, is now quoting $43. The coke situation is extremely bad, owing to high prices and poor deliveries. The railroad situation also continues unsatisfactory.

We quote for delivery in New York as follows:

East. Pa., No. 1 fdy., sil. 2.75 to 3.25	$50.05 to $51.05
East. Pa., No. 2X fdy., sil. 2.25 to 2.75	49.05 to 50.05
East. Pa., No. 2 fdy., sil. 1.75 to 2.25	47.80 to 48.80
Buffalo, sil. 1.75 to 2.25	47.90 to 48.90
No. 2 X Virginia, sil. 2.25 to 2.75	49.60

Ferroalloys.—There continues to be an absence of much demand for ferromanganese for either spot or forward delivery. Prices are firm at $225 to $250 for spot delivery with the American alloy for last half delivery quoted at $200, delivered. Some British alloy is also available for shipment in the last half at $195, seaboard. There are two inquiries for about 150 tons, each for early delivery. It also develops that there is a shipment of about 130 tons by way of Panama Canal from the Pacific Coast which will be available for delivery as soon as it arrives. From just what source this lot comes is uncertain, it being unknown whether it is American or British alloy, or resale material offered by the Japanese. There continues to be some inquiry for export. The 50 per cent ferrosilicon market is inactive, with small lots sold at $80 to $90 per ton, delivered. The spiegeleisen market is strong at $75, furnace, but sales have been light, amounting to only a few small lots for early delivery.

High Speed Steel.—Buying has been light. Domestic producers still quote $1.25 to $1.30 per lb. New York. British high-speed steel is being sold at about $1.15 per lb. New York, but the reported shortage in England of Swedish ore, tungsten and vanadium has caused possible buyers of the imported product to doubt future deliveries.

Warehouse Business.—Although transportation continues to show a slight improvement, mills, as a rule, receive only sufficient cars to ship the daily output and the large stocks piled in yards are not being moved, unless consumers are in a position to call at the mills with their own trucks. The increasing number of embargoed districts also helps to make the warehouse shortage more acute. At present, spring steel is quoted by New York warehouses at practically the same price the mills are now quoting. Hoops, which are quoted at 5.57c. to 6.57c. per lb., are scarce and some warehouses quoting 6.50c. per lb. nominally, state that if they had any in stock, they would be forced to quote as high as 7c. per lb. considering prices now charged by mills. Warehouses point out that consumers who, in some cases are promised material in from two to three months, often through erratic transportation, receive it in five or six weeks and form the conclusion that there is a surplus instead of a shortage. We quote prices on page 1846.

Finished Iron and Steel.—It is quite evident that a distinct easing in the market for steel plates and shapes has developed in the last few days. Steel plates for desirable specifications can be bought at 3.50c., Pittsburgh. Some of the mills have rolling space so that they can fill such orders on short notice and they are especially eager for business of this nature from districts in which conditions permit of ready shipments to the consumer. Demand for export plates is still very good, a sale of 1200 tons to Scotland and of 250 tons to China being noted. One export company has booked 6000 tons of plates for Great Britain in the week. The market for bars, wire and other lighter finished products continues strong. One large independent company which recently sounded the wire market received inquiries for 33,000 kegs of wire nails which it could not entertain. There is continued inquiry on the part of steel, coal and coke companies for steel cars, the total from these sources amounting to 2700 in the last week. The new inquiries include the following: 1000 cars for the Frick Coke Co., 250 for the American Steel & Wire Co., 400 for the Donner Steel Co., 160 for the Republic Iron & Steel Co., and 400 for the Mather Colliery Co., all of 70 tons capacity, and 500 for the Carnegie Steel Co. of 55 tons capacity. Some of these cars may ultimately be purchased by the railroads, but meantime such orders will first help the car works and later will help break the freight blockades. In the structural market no new inquiries are reported, nor have the large projects before the market been officially awarded, such as the 15,000 tons for the Staten Island piers, 9000 tons for the New York court house and 750 tons for the Boston Elevated Railroad. The lowest bidder for the court house is the Bethlehem Steel Bridge Co. and it is understood that the six piers for Staten Island have been awarded, two to Snare & Triest, two to Post & McCord, and two to a New York fabricator. The American Locomotive Co. has received an order for 12 Pacific type locomotives from the Pere Marquette Railway Co.

We quote for mill shipment, New York, as follows: Soft steel bars, 2.62c. to 4.52c.; shapes, 2.72c. to 4.27c.; plates, 2.92c. to 4.27c., the minimum prices being for indefinite delivery and the highest prices for delivery in a few weeks; bar iron, flats, wider than 6 in., 4.57c.; ⅜ and ⅞ in., round and square, 5.27c.; light rounds, squares and flats, 5.77c., and other sizes, 4.27c.

Cast-Iron Pipe.—The city of Detroit has been asking for 7000 tons of pipe. Other inquiries and orders are small in quantity, but many in number. We quote 6-in. and heavier at $76.30, New York; 4-in., $79.30 with $2 additional for Class A and gas pipe.

Old Material.—While prices of other grades are declining, heavy melting steel remains firm because of demand for export and for Pittsburgh consumption. Were dependency for sales restricted to the eastern Pennsylvania district, lower prices would prevail, since $22.50, or possibly $23, is all that is obtainable there. Brokers are paying $21.50, delivered to near Philadelphia, for steel, to which they add $1 commission to obtain the consumer's price. No. 1 railroad wrought and pipe are slightly lower.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$19.50 to $20.00
Rerolling rails	28.00 to 29.00
Relaying rails, nominal	52.00 to 54.00
Steel car axles	38.00 to 39.00
Iron car axles	42.00 to 43.00
No. 1 railroad wrought	29.00 to 30.00
Wrought iron track	22.00 to 22.50
Forge fire	14.00 to 14.50
No. 1 yard wrought, long	23.50 to 24.00
Light iron	9.00 to 10.00
Cast borings (clean)	17.00 to 17.50
Machine-shop turnings	15.00 to 15.50
Mixed borings and turnings	14.50 to 15.00
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	18.50 to 19.00
Stove plate	24.00 to 24.50
Locomotive grate bars	26.00 to 27.00
Malleable cast (railroad)	29.00 to 30.00
Old car wheels	35.00 to 37.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$38.00 to $39.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	37.00 to 38.00
No. 1 heavy cast, not cupola size	30.00 to 31.00
No. 2 cast (radiators, cast boilers, etc.)	31.00 to 32.00

Philadelphia

PHILADELPHIA, June 22.

What may be termed the second railroad strike, which started in Philadelphia and Baltimore Friday and has been spreading to other districts, has put an additional damper on an already dull market and is not only discouraging inquiries and preventing deliveries, but threatening the plants with shutdowns because of inability to get raw materials on account of embargoes again placed. Blast furnaces and steel-making industries using limestone are further handicapped by the latest order of the Interstate Commerce Commission, effective June 21, preventing the use of open-topped, hopper-bottom or drop-bottom cars for anything ex-

cept coal and coke. A previous order, less drastic, favored these latter commodities partially. This last order, known as No. 7 and issued over the signature of W. C. Kendall, manager of the car service commission, Washington, favors coal and coke wholly with an absolute disregard for limestone.

The largest inquiry of the week is for 25,000 tons of plates for Great Britain for the building of a dozen ships. The inquirers are shopping around and expect to obtain them for as low as 3.50c., especially since this price was quoted freely to the Pennsylvania railroad recently. The inquiry for 18,000 tons of plates, reported last week, came from Seattle, Wash., for a water line, but it is reported that wood will be substituted.

One pig iron producer of low phosphorus pig iron advanced its prices this week $3 a ton to $50, and another producer is considering a similar advance. Heavy melting steel is a trifle stronger because of the demand for export. Because two heavy tonnage producers of plates and bars, respectively, have been shut down for 10 days in the Pittsburgh district on account of labor troubles, eastern Pennsylvania makers will profit thereby, it is expected. Though plates and shapes tend to softness, bars remain firm.

Pig Iron.—Inquiry is slight and prices remain firm. A maker of copper-bearing low phosphorus has advanced from $47 to $50, effective June 21. Another maker of low phosphorus is considering an advance of at least $2. The Norfolk & Western railroad, which placed an order for 1740 tons of malleable, as announced last week, has also placed about 3500 tons of foundry iron with one Virginia producer, though its past custom has been to share with three makers on its lines. Though $45, base, is the market price for Virginia iron, it is obtainable at a less figure, as instanced by a recent purchase of a Wilmington, Del., shipbuilder. Though $44 has been popularly quoted for basic, one maker offers about 400 tons for $43.50. The Standard Steel Works has been inquiring for low phosphorus iron. Coke continues upward, sales having been made at $17.25, with quotations as high as $17.50, ovens.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa., No. 2 X, 2.25 to 2.75 sil.	$47.15 to $49.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	45.90 to 48.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	49.10
Virginia No. 2 X, 2.25 to 2.75 sil.	50.35
Basic deliv. eastern Pa.	44.80
Gray forge	43.00 to 44.00
Standard low phos. (f.o.b. furnace)	52.00
Malleable	48.10 to 48.60
Copper bearing low phos. (f.o.b. furnace)	47.00 to 50.00

Ferroalloys.—The ferromanganese market is easier, though makers are loath to admit it. They are anxious to get prompt and future business, however. Deliveries of manganese ore are good.

Semi-Finished Steel.—More demand for billets, particularly forging, is reported. Open-hearth rerolling billets, 4 x 4-in. and larger, are quoted at from $65 to $70, Pittsburgh, with forging billets at from $75 to $85. Two sales of 2000 tons each of sheet bars were recently made to a consumer in the Pittsburgh district.

Plates.—A British interest is asking for 25,000 tons of plates for 10 or 11 ships to be built there. The would-be purchaser is shopping around in the expectation of getting the 3.50c. price and satisfactory delivery. Because of the apparent plentifulness of plates, it is expected he will be successful. The inquiry for 18,000 tons of plates for a water line in Seattle, Wash., has been abandoned in favor of wooden pipes, it being intimated that local pride over the forestry resources of the West is a contributive factor. The Pennsylvania railroad is asking for about 350 tons of plates, to be purchased from the maker offering the promptest delivery, irrespective of price. The Baldwin Locomotive Works is asking for 200 tons. A large shipment of plates was loaded on the Delaware last week for a shipbuilder in Belfast, Ireland, having been sold originally by the Board of Survey, Appraisal and Sale at the Philadelphia Navy Yard to the Western Pipe & Machinery Co., Philadelphia.

Bars.—The demand keeps up from railroads, jobbers and manufacturers, and 4c. remains the most universally quoted price. The Pennsylvania railroad recently inquired for 3200 tons of bars. A sale of 300 tons of deformed bars was recently made at 4.075c. at mill, .075c. representing the extra charge for the deformation.

Rails.—The Lackawanna Steel Co. recently sold 1000 tons of rails at a trifle less than $60. A manufacturer of frogs and switches is asking for 1000 tons of rails to be manufactured into frogs and switches for the Pennsylvania Railroad.

Sheets.—An eastern Pennsylvania maker of blue annealed sheets has just raised the price on No. 10 gage from 5.50 to 5.75c. The company is farther behind on orders than ever.

Old Material.—Export demand has boosted a trifle the price of heavy melting steel, though other items are weaker. For export $25, delivered Philadelphia port, is obtainable, with $24 secured at Baltimore. The fact that $26.50 has been obtained in the Pittsburgh district also is a strengthening factor. For export the best grade of steel is demanded. The business is a hazard because of shipping difficulties and the liability of price changes before shipment. Though one consumer near Philadelphia is paying $22.50 for steel, 50c. more can be obtained in this district.

No. 1 heavy melting steel	$23.00 to $23.50
Steel rails rerolling	32.00 to 33.00
No. 1 low phos., heavy 0.04 and under	30.00 to 31.00
Car wheels	38.00 to 40.00
No. 1 railroad wrought	33.00 to 34.00
No. 1 yard wrought	26.00 to 27.00
No. 1 forge fire	17.50 to 18.00
Bundled skeleton	17.50 to 18.00
No. 1 busheling	20.00 to 21.00
No. 2 busheling	17.00 to 18.00
Turnings (short shoveling grade for blast furnace use)	17.00 to 18.00
Mixed borings and turnings (for blast furnace use)	16.50 to 17.50
Machine-shop turnings (for rolling mill and steel works use)	18.50 to 19.00
Heavy axle turnings (or equivalent)	20.00 to 20.50
Cast borings (for rolling mills)	20.00 to 21.00
Cast borings (for chemical plants)	21.50 to 22.50
No. 1 cast	37.00 to 38.00
Railroad grate bars	31.00 to 33.00
Stove plate (for steel plant use)	27.50 to 28.50
Railroad malleable	28.00 to 29.00
Wrought iron and soft steel pipes and tubes (new specifications)	22.00 to 23.00
Iron car axles	45.00 to 46.00
Steel car axles	42.00 to 44.00

Boston

BOSTON, June 22.

Pig Iron.—The market has been quiet the past week, the aggregate sales being about 2000 tons. Alabama iron, which a week ago led the market in activity, is slow on a $42 furnace base. More eastern Pennsylvania iron has sold recently at $45, furnace base, than at higher prices, and more Virginia at $44 than at $45, which gives the market an easier appearance than really actually exists, for a majority of furnaces are holding to top prices except on off iron. A limited tonnage of Buffalo, last half, resale iron, running high in silicon, above 2.75, and of malleable, is available at $45, furnace base. One lot, silicon 3.25 to 3.75, sold at $50, furnace. Five cars of Lake charcoal iron, about 250 tons, last half delivery, sold at $55, furnace. The Salisbury Iron Corporation, Lime Rock, Conn., charcoal iron, closed for lack of coke, etc., has resumed operations. It is far behind on contract orders. The last quotation made on Salisbury iron was $65, furnace. Quite a little all-rail iron has come into New England the past week, but the Delaware & Hudson once more has placed an embargo on Boston & Maine and Boston & Albany Railroad shipments. New England foundries are anxious to secure all contract iron prior to Sept. 1, when freights are due to advance 30 per cent. Delivered pig iron prices follow:

East. Penn., sil. 2.25 to 2.75	$50.15 to $51.15
East. Penn., sil. 1.75 to 2.25	48.90 to 49.90
Cent. & West. Penn., sil. 2.25 to 2.75	49.95 to 50.95
Cent. & West. Penn., sil. 1.75 to 2.25	48.70 to 49.70
Buffalo, sil. 2.25 to 2.75	49.15 to 50.15
Buffalo, sil. 1.75 to 2.25	47.90 to 48.90
Virginia, sil. 2.25 to 2.75	49.95 to 50.95
Virginia, sil. 1.75 to 2.25	48.70 to 49.70
*Alabama, sil. 2.25 to 2.75	49.45
*Alabama, sil. 1.75 to 2.25	47.75

*Alongside Boston prices.

Coke.—The New England Coal & Coke Co. has advanced its price on foundry coke $1 per ton to $19.90, delivered, where the freight rate does not exceed $2.40 a ton. It also has established a minimum f.o.b. oven Everett price of $17.50 a ton, which works out to the disadvantage of those foundries located at points where the freight rate is less than $2.40. For instance, the freight rate from Everett to West Lynn is $1 a ton, so the f.o.b. ovens price to a consumer like the General Electric Co. is $18.90. The New England Coal & Coke Co. is not increasing its foundry coke output owing, it is reported, to its inability to secure coking coals in desired quantities. A Providence, R. I., foundry has just contracted for its remainder of the year coke requirements, buying a Connellsville product at $20.40 delivered, or a $16 Connellsville ovens basis.

Ferrosilicon.—Ferrosilicon is still required by melters who are short of old material, etc., two 1000-lb. lots having sold since last reports at unchanged prices.

Warehouse Business.—Iron and steel are coming forward from the mills more freely, but not in sufficient quantities to permit any accumulation of stocks. Anything under ¾-in. round in iron or steel is sold long before it arrives. Local jobbing quotations on horseshoes have been reduced 50c. per keg to $7.50 base. Eagle carriage bolts, which were quoted at 60 per cent discount are now 50. Manufacturers' lists and discounts on expansion shields have been revised upward. The Stanley Works, New Britain, Conn., has issued a new list on washers, which shows advances of ½c. to 1c. per lb.

Jobbers quote: Soft steel bars, $5.50 to $6.50 per 100 lb. base; flats, $6.50 to $6.85; concrete bars, $6 to $6.50; tire steel, $7 to $7.50; spring steel, open hearth, $11; crucible, $16; steel bands, $8 to $8.25; steel hoops, $9; toe calk steel, $8; cold-rolled steel, $10 to $10.50; structural, $6 to $6.50; plates, $6.50; No. 10 blue annealed sheets, $9; No. 28 black sheets, $9.15; No. 28 galvanized, $10.50; refined iron, $5.50 to $8; best refined, $7 to $7.50; Wayne, $8.50; band iron, $8; hoop iron, $9; Norway iron, $20.

Old Material.—Local interest in old material centers very largely in heavy melting steel, for which the market, although higher, is mixed. Three Boston dealers are buying for export, paying as high as $22 and $22.50, delivered dock, and offering, in one case, at least, as high as $23. Two dealers last week shipped 2000 of a 10,000-ton order they have for Liverpool and Scotland. One dealer is paying $20 against an old Pennsylvania mill order, and another $18, f.o.b. shipping point, or $21.50, delivered at mill, against an old order. Prices on heavy melting steel, therefore, take an exceptionally wide range. There is a little buying of pipe among the brokers, and chemical interests are taking some borings, but the market otherwise is quiet and barely steady. Rejections continue, but less frequently than was the case a week ago. Old material prices, f.o.b. local yards, follow:

No. 1 heavy melting steel	$18.00 to $21.00
No. 1 railroad wrought	24.00 to 25.00
No. 1 yard wrought	22.00 to 23.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	18.00 to 19.00
Machine shop turnings	13.00 to 14.00
Cast iron borings	15.50 to 16.00
Heavy axle turnings	15.50 to 16.00
Blast furnace borings and turnings	13.00 to 13.50
Forged scrap	13.00 to 13.50
Bundled skeleton	13.00 to 13.50
Street car axles	31.00 to 32.00
Car wheels	37.00 to 38.00
Machinery cast	38.00 to 39.00
No. 2 cast	34.00 to 35.00
Stove plate	24.00 to 25.00
Railroad malleable	26.00 to 27.00
Rerolling rails	27.00 to 28.00

Buffalo

BUFFALO, June 21.

Pig Iron.—While furnaces generally are opposed to committing themselves for extensive future delivery, there has been some selling during the past week. One furnace reports selling 1500 tons of foundry iron at $45 base. This furnace also contracted for 500 tons of malleable at the prevailing market quotation of $46.25. Another furnace accepted a considerable tonnage for fourth quarter delivery. There has been a very slight improvement in car supplies, but the railroad situation is still very unsatisfactory and much furnace output is being piled. Strong pressure is being exerted for iron by melters in some cases, and there is considerable inquiry on new business. One furnace estimates it could easily place 10,000 tons of foundry iron if it were prepared to accept it, but conditions are such at the present time that many inquiries which would ordinarily be eagerly accepted cannot be entertained, and traffic conditions do not promise to be much brighter for the rest of the summer. No furnace has yet announced itself ready to accept 1921 tonnage, and it is doubtful if any of this iron will be contracted for before late midsummer, as costs seem certain to mount. In addition, district furnaces, with the tremendous loss of production to overcome, will be hard put to it to make deliveries on approximately the time contracted for.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 sil	$48.00
No. 2 X foundry, 2.25 to 2.75 sil	46.25
No. 2 plain, 1.75 to 2.25 sil	45.00
Basic	$44.00 to 45.00
Malleable	46.25
Lake Superior charcoal	58.00 to 60.00

Coke.—Consumers are bringing tremendous pressure to bear, but generally unsuccessfully. Sales agencies report coke selling from $15 to $16.50, Connellsville, when it can be obtained. Shortage of cars has caused many ovens to shut down, with consequent curtailment of supply. By-product plants are in even worse shape because two separate car movements are necessary. The coal must be brought to them and coke must be shipped out. One large eastern maker committed to 60,000 tons up to this time has not been able to ship a ton.

Old Material.—Equipment is becoming increasingly difficult to obtain, and scrap shipments are practically nil. With open cars in heavy demand for other shipments, it is possible that the railroads may withdraw them entirely from scrap movement. Dealers cannot see any immediate improvement ahead. There is outside demand for heavy melting steel, one Pittsburgh consumer being in the market for a considerable tonnage. Some sales of turnings have been made from this district to the Philadelphia district. Brokers in Pittsburgh are offering $40 for car wheels delivered, Pittsburgh. A local mill is offering $24 for heavy melting steel, but is unable to secure any large tonnages at this price. We quote dealers' asking prices, f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$23.50 to $24.50
Low phos., 0.04 and under	31.50 to 32.50
No. 1 railroad wrought	30.50 to 31.50
No. 1 machinery cast	37.50 to 38.50
Iron axles	39.00
Steel axles	39.00
Car wheels	37.00 to 38.00
Railroad malleable	30.50 to 31.50
Machine-shop turnings	15.00 to 16.00
Heavy axle turnings	19.50 to 20.50
Clean cast borings	16.50 to 17.50
Iron rail	29.50 to 30.50
Locomotive grate bars	23.50 to 24.50
Stove plate	31.50 to 32.50
Wrought pipe	20.50 to 21.50
No. 1 busheling	19.50 to 20.50
Bundled sheet stamping	16.50 to 17.50

Finished Iron and Steel.—Transportation conditions are still operating to hamper the market. The car supply is reported to be slightly worse than last week, and no real improvement seems to be in sight. Mill operation is held back from normal by shortage of cars. The market still shows an active inquiry for most grades. It is a little heavier than last week, the pressure for bars, cold-finished material and tin plate being particularly strong. The recent demand for plates is continuing from ship-building interests. A local mill is offering almost prompt delivery and at 3.75c. Outside independent mills are still asking 4c., while the leading interest keeps its price at 2.65c. for delivery early in 1921. Inquiries for plates range from carloads to 200 tons, though there have been some larger inquiries, also. Acceptance is not large. Mills, unable to ship, are in some cases nearing the end of their storage facilities. There is a strong demand for tubular products. Demand for wire products keeps up. The John W. Cowper Co., Buffalo, has closed a contract for the erection of a store house and truck shop for the American Car & Foundry Co., Buffalo, requiring 300

tons of steel to be furnished by the Buffalo Structural Steel Co. and for the erection of a boiler house requiring 550 tons of steel to be furnished by the Kellogg Structural Steel Co. The first contract approximates $125,000 and the second $250,000.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoop, 6.06c.; cold rolled steel, 6.00c.

Cincinnati

CINCINNATI, June 22.

Pig Iron.—More interest is being shown by pig iron buyers than has been the case for the past few weeks, and several sellers report a fair-sized inquiry during the week. This is particularly true of malleables, new inquiry now before the market being for 4000 tons from an Indiana melter for shipment over the last half, while a central Ohio manufacturer is inquiring for 1000 tons for the same delivery. A central Ohio implement manufacturer is reported to have bought 10,000 tons of malleable from a Chicago district furnace, and the same interest took 400 tons of foundry, silicon 2.25 to 2.75 from a southern furnace, paying $43.25, Birmingham. Another central Ohio melter took the same tonnage at the same figure. Other sales noted include one of 750 tons, silicon 1.75 to 2.25, to a nearby melter at $42, Birmingham. This iron is understood to be for reasonably early shipment. With the exception of those noted above, sales during the week have been for small tonnages for prompt shipment. A nearby manufacturer is offering for resale, through a local house, 2000 tons of foundry iron. Steel making irons are reported to be very scarce and higher prices are predicted. On the recent inquiry for 10,000 tons of basic from a southern Ohio steel plant, it is reported that only one furnace was able to make the delivery wanted. This order has not yet been placed. A local pig iron house reports inquiries having been received by its New York office for 20,000 tons of foundry and 80,000 tons of basic for export. Belfont furnace at Ironton will be blown in on Bessemer the latter part of the week after being out for a general overhauling for nearly a year. Lawrence furnace of the Marting Iron & Steel Co. is banked on account of the shortage of coke, and it is reported that several Virginia furnaces are banked for the same reason.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	46.85
Ohio silvery, 8 per cent sil	59.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	46.80
Basic Northern	41.80
Malleable	$45.80 to 46.80

Coke.—The coke situation shows slight improvement. Coke oven operators in this district report difficulty in securing sufficient coal, even when they offer top prices. Car shortage is very severely felt at the coal mines, placements being reported at about 40 per cent of normal. Some improvement is noted in shipments from the Connellsville field, but a representative of a local concern, who recently visited the Wise county field, reports that the car shortage there is serious. He reports that there is coke available if cars could be had to move it. High prices continue and $17.50 was paid for a small tonnage of Connellsville foundry during the week. The usual quotation remains at from $15 to $16, however, with furnaces paying $15.25.

Finished Material.—Local warehouses report business brisk in all lines of finished products. A local jobber on an inquiry for several hundred tons of steel bars received quotations ranging from 3.25c. to 4.50c. The usual quotation from independent mills is 4c., Pittsburgh. A Detroit automobile manufacturer is inquiring for automobile body sheets for delivery during the third quarter, but is meeting with no encouragement from mills in southern Ohio, as these are all sold up for this period. Shapes and plates are quiet. The American Co. has let the general contract for its new Cincinnati plant to the Ferro Concrete Construction Co. Two units of the plant will be of steel construction and will take about 500 tons. This has not yet been placed. Nail mills operating in this district report a heavy export demand.

Jobbers quote: Iron and steel bars, 5c. to 6c.; structural shapes, 5.10c.; plates, 5c.; steel bands, 6.50c.; No. 10 blue annealed, 7.50c.; No. 28 black sheets, 9c. to 10c.; No. 28 galvanized sheets, 10c. to 11c.

Old Material.—Dealers report that the scrap market is showing more activity. Some sales of heavy melting steel are reported to mills in the Pittsburgh district. Some dealers have marked down several items about $1, but others are adhering to prices in effect for the past several weeks.

We quote dealers' buying prices:

Per Gross Ton	
Bundled sheets	$15.00 to $16.00
Old iron rails	27.00 to 28.00
Relaying rails, 50 lb. and up	48.00 to 49.00
Rerolling steel rails	29.00 to 30.00
Heavy melting steel	21.50 to 22.50
Steel rails for melting	24.00 to 25.00
Car wheels	29.00 to 30.00
Per Net Ton	
No. 1 railroad wrought	$25.00 to $26.00
Cast borings	11.50 to 12.00
Steel turnings	9.50 to 10.00
Railroad cast	31.00 to 32.00
No. 1 machinery	35.00 to 36.00
Burnt scrap	22.00 to 23.00
Iron axles	29.50 to 30.00
Locomotive tires (smooth inside)	23.50 to 24.50
Pipes and flues	16.00 to 16.50
Malleable cast	22.00 to 22.50
Railroad tank and sheet	16.00 to 16.50

Birmingham

BIRMINGHAM, ALA., June 22.

Pig Iron.—Birmingham iron market experienced another quiet week. A report that some tonnage had been sold at below $42 was not confirmed. If such a sale was made, it was one of off iron. The largest week's business by any one company was about 5000 tons, which went over a wide territory. The bookings included 450 tons for Texas delivery and lots of 200 to 500 tons for the Middle West and the South. Incoming pipe shops in Alabama have ordered a considerable tonnage. It has been ascertained that the bulk of the export iron recently ordered will be delivered before the expiration of the fourth quarter. Outside of possibly one interest, there is probably not over 25 per cent of last half capacity unsold. Some tentative inquiry for 1921 has been made, but no business has been done. Furnace operations are progressing finely. Four furnace concerns are adding to their own coke supply by securing additional from the Semet-Solvay Co. These are the Alabama, the Woodstock, the Sheffield Corporation and the Central Coal & Iron companies. The Woodward Iron Co. continues to get a partial supply from the Alabama By-products Co. It is by calling in this extra amount of coke that the furnaces have been enabled to get along so well. Practically all interests are piling iron. One is known to have shipped up to June 20 less than half its make. The car shortage has become almost as acute in iron movements as it has proven in the coal business. There is practically full operation at all steel mills and in plants manufacturing finished products in iron and steel. The lull in business is regarded as seasonable and has in no wise affected the market's strength.

We quote per gross ton, f.o.b. Birmingham district furnaces, the Tennessee company excepted, as follows:

Foundry, sil. 1.75 to 2.25	$42.00
Basic	41.00
Charcoal	55.00

Cast Iron Pipe.—Water and gas pipe shops continue to receive a fair aggregate of orders from Southern and Southwestern municipalities for extensions. No big work of any kind has recently cropped out, but the small sizes are ordered to capacity of plants. The Somerville sanitary pipe works at Chattanooga, probably largest in the South, has just begun operations, coming in about the same time as the Imperial at Bessemer. Sanitary makers report no let-up in demand.

Coal and Coke.—Alabama coal mines made the best record in months in the last reported week, the output

being 324,000 tons, an increase of about 25,000. Alabama coal miners held a convention in Birmingham behind closed doors. They give out that there will be no general strike. Foundry coke is strong at $12 to $15 for spot.

Old Material.—The scrap market has reached a point that may be characterized as stagnant, the business consisting of deliveries on old contracts.

We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$21.00 to $22.00
No. 1 steel	19.00 to 20.00
Cast iron borings	14.00 to 15.00
Machine-shop turnings	14.00 to 15.00
No. 1 cast	34.00 to 35.00
Car wheels	32.00 to 33.00
Tramcar wheels	31.00 to 32.00
Steel axles	29.00 to 30.00
No. 1 wrought	26.00 to 27.00

St. Louis

ST. LOUIS, June 21.

Pig Iron.—Purchasing has been confined to scattered tonnages of small size, mainly by melters needing iron to fill in because of delayed deliveries on contracts. There were no inquiries of any size before the market during the week. Apparently there is ample iron to sell, but it is extremely difficult to interest consumers. For the most part, the buying contingent is of opinion that any change in prices between now and the end of the year will be in their favor, and they see no reason for buying ahead. Further a discouragement to additional purchases is the acute shortage of coke and coal. Several plants have been forced to temporarily suspend or curtail operations because of the paucity of fuel. Consumption, however, proceeds in great volume and foundries have orders which will occupy their capacity production for some time to come. Nominally the market is steady at $42, Birmingham, for 1.75 to 2.25 per cent silicon, but doubtless this figure would be shaded for cash. The Mississippi Valley Iron Co. has overcome minor difficulties with its new machinery, and is now producing at the rate of 300 to 350 tons daily. Its product is sold up through the third quarter. This company is getting its coke from Terre Haute, Ind.

Coke.—Absolutely no relief has materialized in the tight coke situation prevailing in this district and to the west. Extravagant premiums are being offered by users with urgent orders to complete for a car or two. Transportation has limbered up a bit, and a few more trains are getting through, but the main difficulty is cars, ovens complaining of absolute inability to have equipment placed at their platforms. Points in the West which have never before applied to this market are endeavoring to obtain supplies through local dealers. The Connellsville 72-hr. product is quoted at $16, ovens, which is really a nominal figure, as nothing is being offered. Southern ovens have offered nothing in weeks.

Finished Iron and Steel.—There has been no diminution in the demand for standard articles in this category. Warehouse interests are much behind on deliveries, and find it impossible to replenish depleted stocks because of transportation disabilities. The most notable scarcity is in nails, the dearth of which amounts to famine. Building operations have been hampered, and there is a story from California to the effect that fruit shippers can not obtain nails sufficient to fasten up their crates and boxes. Tubular goods are in great request in the oil areas to the southwest. Prices are steady with a somewhat firmer tendency.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.50c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 7.09c.; No. 28 black sheets, cold rolled, one pass, 8.10c.; No. 28 galvanized sheets, black sheet gage, 9.60c. to 10c.

Old Material.—The Government's embargo against the use of flat cars for loading iron and steel scrap, effective June 16, has further complicated an already sadly inefficient transportation situation. Still the market holds firmer, the spurt of the preceding week being continued. Two important mills have been closed down by fuel shortage, but otherwise things are active, and consumption heavy. At the moment mills are not buying, but there are fair exchanges between dealers at firm to higher figures. Steel axles, shafting, rerolling rails, frogs, switches and guard rails are wanted, scarce and higher. Railroads offered nothing in the week, and are marketing their scrap only as congestion on their lines will permit of its movement.

We quote dealers' prices f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$31.50 to $32.00
Old steel rails, rerolling	30.00 to 30.50
Old steel rails, less than 3 ft.	24.00 to 24.50
Relaying rails, standard sections, subject to inspection	50.00 to 55.00
Old car wheels	34.50 to 35.00
No. 1 railroad heavy melting steel	22.50 to 23.00
Heavy shoveling steel	21.00 to 21.50
Ordinary shoveling steel	20.50 to 21.00
Frogs, switches and guards, cut apart	22.50 to 23.00
Ordinary bundled sheets	13.00 to 13.50
Per Net ton	
Heavy axle and tire turnings	14.00 to 14.50
Iron angle bars	27.00 to 27.50
Steel angle bars	21.00 to 21.50
Iron car axles	39.00 to 39.50
Steel car axles	32.50 to 33.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	25.00 to 25.50
No. 2 railroad wrought	23.00 to 23.50
Railroad springs	21.50 to 22.00
Steel couplers and knuckles	21.00 to 21.50
Locomotive tires, 42 in. and over, smooth inside	20.00 to 20.50
No. 1 dealers' forge	20.00 to 20.50
Cast iron borings	13.00 to 13.50
No. 1 busheling	19.00 to 19.50
No. 1 boiler, cut to sheets and rings	15.00 to 15.50
No. 1 railroad cast	34.00 to 34.50
Stove plate and light cast	26.00 to 26.50
Railroad malleable	24.00 to 24.50
Agricultural malleable	23.00 to 23.50
Pipes and flues	16.50 to 17.00
Heavy railroad sheet and tank	15.00 to 15.50
Railroad grate bars	26.00 to 26.50
Machine-shop turnings	11.50 to 12.00
Country mixed	17.50 to 18.00
Uncut railroad mixed	18.00 to 18.50
Horseshoes	24.50 to 25.00

Cleveland

CLEVELAND, June 21.

Iron Ore.—Producers and consumers of Lake Superior iron ore will make a hard fight against granting the application of the railroads for an increase of 22c. a ton in the freight rate on ore from lower Lake ports to interior furnaces. Most interior furnaces agree that the railroads are entitled to a reasonable pro rata increase over existing rates, but they object most emphatically to any flat rate increase that would make the advance the same for a short haul as for a long haul. Nearly all producing and consuming interests are also united in opposing a plan that has been proposed by the Jones & Laughlin Steel Co. to make the haul from the mines to the upper Lake ports and the haul from the lower Lake docks to the furnaces a through haul and to advance the upper Lake rates proportionately, so that whatever advance is allowed would be distributed among both Lake furnaces and interior furnaces. The Jones & Laughlin proposal would advance the 1917 rates of the upper Lake roads 74c., this advance to be distributed later between the upper Lake and lower Lake roads. This company has taken the stand that should the advance be made in rates from lower Lake docks to interior furnaces, the Lake front furnaces would have an undue advantage over the interior furnaces. The plan of the Jones & Laughlin Steel Co. has been prepared in the form of a petition to be presented to the Interstate Commerce Commission, and if the petition is filed with the commission the ore shippers, unless they change their present plan of procedure, will abandon their previous plan of sending a committee to Washington to oppose the flat increase through their organization, the Lake Superior Ore Association, and instead a protest against the flat advance in rates will be made by 30 or 40 mining companies which have pooled their interests in the rate matter. The reason that the Ore Association has practically decided not to make a protest before the Interstate Commerce Commission is that with the Jones & Laughlin Co., a member, proposing a different plan, the association cannot go before the commission with a united front. The Lake front furnaces are particularly interested in opposing the Jones & Laughlin plan, and it is understood that the Buffalo and some of the Chicago furnaces would join the Lake Erie furnaces in protesting. Furnaces in the Mahoning Valley in particular are objecting to the application of the railroads for a flat increase in rates. Ore producers are opposed to the Jones &

Laughlin plan because royalty rates would be increased were this through haul plan adopted, since in most cases royalties are based on the price of ore delivered at lower Lake points and consumers interested in mining companies are also opposed to the plan. Representatives of the mining companies, too, will protest against the proposed 24 per cent advance on ore rates from mines to the upper Lake ports, this being the advance that the railroads in the western classification are asking for. Mining companies and shippers contend that rates on ore from the mines to upper Lake ports are already excessive. It is expected that the entire subject of ore rates will be taken up by the Interstate Commerce Commission late this week.

The ore transportation system from the standpoint of car supply at the lower Lake ports has grown worse during the past few days and the car shortage is more acute than at any time in the history of the ore trade. It was expected that by diverting cars to coal the shortage would be relieved somewhat, as coal cars, after bringing coal to the lower Lake ports, would take ore back to the furnaces. However, a large percentage of the cars apparently are being used for hauling coal to points other than lower Lake ports. Boats have been held up at Lake Erie ports as long as 10 days waiting to unload cargoes. On Monday there were over 100 cargoes of ore at Lake Erie ports waiting to be unloaded. At the Pennsylvania dock in Ashtabula, 11 cargoes of ore were tied up with an available supply of 15 cars. At the Pennsylvania dock in Cleveland there were 11 boats waiting to unload and only 83 cars available. No action has been taken by the Interstate Commerce Commission on the application of some of the ore shippers for the pro-rating of ore shipments to the furnaces under a plan somewhat similar to the pooling which has been adopted in the coal trade. Some of the shippers are not very hopeful that the commission will grant the request, but they are still making efforts to secure sanction of the commission to a pro-rating arrangement.

We quote, delivered lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Pig Iron.—The market is more active than for several weeks. There is some demand for basic iron for prompt shipment, partly due to the blowing out of one Valley furnace and the changing of another to foundry iron. Among inquiries are one from a north central Ohio steel plant. However, very little basic iron is available. One resale lot of 2000 tons has been withdrawn from the market. Recent sales include a 7500-ton lot of basic iron placed with a Lake furnace by an Indiana consumer. One interest reports sales aggregating 3300 tons during the week, including 1500 tons of malleable iron for gray iron foundry purposes to a Michigan automobile foundry at $43.50. An Indiana melter is inquiring for 4000 tons of malleable iron for last half and an Ohio gray iron foundry for 1000 tons of high silicon malleable iron for the same delivery. A New York broker is inquiring for 80,000 tons of basic iron and 20,000 tons of No. 1 foundry iron for export for early shipment and a Pittsburgh broker is asking for 30,000 tons of Southern iron for export, with deliveries extending through last half and first quarter. Foundry iron is quoted at $44 for No. 2 for last half and $44 to $45 for early shipment. One Valley interest that has been making early shipment sales at $44 has advanced its price on some sales to $45. Sales of Southern iron in small lots for early shipment are reported at $42 for No. 2. We note the sale of 100 tons of 10 per cent Bessemer ferrosilicon at $67.50. The supply of cars for shipping pig iron became scarcer during the week and some of the furnaces were compelled to pile part of their iron. Furnaces have been able to take good care of their foundry trade, but considerable tonnage of basic iron needed by consumers is held in furnace yards because of the lack of cars.

We quote delivered Cleveland as follows, based on 40c. switching charge for local iron, a $1.40 freight rate from Valley points, and $5 from Birmingham:

Basic		$44.40
Northern, No. 2 fdy., sil. 1.75 to 2.25	$44.40 to	45.40
Southern foundry, sil. 2.25 to 2.75	..	48.70
Gray forge		41.40
Ohio silvery, sil. 8 per cent	58.90 to	60.40
Standard low phos., Valley furnace	51.00 to	53.00

Coke.—Several sales of foundry coke were made during the week at $16 for standard Connellsville coke for prompt shipment, but the seller's price has been advanced to $17 and still higher prices are predicted. Two Eastern consumers of blast furnace coke have placed contracts for last half of the year on the basis of four tons of coke for a ton of basic iron. Shipments of foundry coke are very slow because of the scarcity of cars.

Sheets.—The sheet situation has eased up considerably, particularly in respect to blue annealed sheets. The 5.50c. quotation on this grade is more common, and there is an unconfirmed report of the placing of a round lot at 5c. Black sheets are easier at 7c. to 7.50c., and galvanized sheets are quoted from 7.50c. to 8c., for No. 28 gage.

Finished Iron and Steel.—The railroad situation has grown worse. Shipments are very slow from the Pittsburgh district because of the car shortage, and many consumers are suffering from lack of steel. The market shows more activity in some directions, particularly in the demand for plate for oil tanks. An Ohio tank shop has placed 1200 tons and two inquiries each for 2000 tons are pending, as well as another inquiry for from 350 to 17,500 tons for from 1 up to 50 tanks. Mills are quoting plates at 3.50c. to 3.75c. for early shipment, the former now being the usual quotation for round lots. Steel bars are in good demand, and while prices quoted by independent mills range from 3c. to 4c., very little steel is available at the former price for early shipment. Sales are reported at 3.75c. and 4c., and one mill turned down an offer of 4c. for a 2000-ton lot. Building work continues inactive, but stock orders for structural steel are being placed for early shipment at 4c., with a Pittsburgh mill, which has also taken 600 tons of channels for tank cars at that price. Another independent mill is taking structural material at 3.25c. There is considerable inquiry from consumers for contracts at the minimum market prices and the leading interest is replacing tonnages shipped with additional orders. However, there is a tendency among consumers not to buy for stock at the higher prices quoted by the independent mills. Some of the implement manufacturers have enough steel under contract to last until October and are deferring additional purchases.

Cleveland warehouses quote steel bars at 3.27c. to 5c.; plates, 3.57c. to 5c., and structural material, 3.70c. to 5.10c.

Bolts and Nuts.—There is a good demand for bolts and nuts both for prompt shipment and third quarter contracts. Many of the makers are sold up so far ahead that they decline to take contracts. Production is greatly curtailed because of the inadequate supply of raw material, particularly wire. Prices are firm.

Old Material.—The scrap market is dull and prices on steel making grades are not firm. Shipments are very slow because of the scarcity of cars. About the only activity is between dealers who are in the market for heavy melting steel scrap to fill contracts with Valley mills. These are offering around $25 for this grade for delivery to Youngstown and $23.50 to $24.10 for delivery to Canton. Borings and turnings are inactive and weak. Local dealers are offering $32 for railroad malleable.

Dealers quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$22.75 to $23.00
Steel rails, under 3 ft	25.00 to 27.75
Steel rails, rerolling	31.00 to 32.00
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. melting scrap	26.25 to 26.50
Cast borings	15.75 to 16.00
Machine shop turnings	11.25 to 11.50
Mixed borings and short turnings	15.25 to 15.50
Short turnings for blast furnaces	15.25 to 15.50
Compressed steel	18.00 to 18.50
Railroad wrought	28.00 to 29.00
Railroad malleable	31.00 to 32.00
Steel axle turnings	19.50 to 20.00
Light bundle sheet scrap	14.00 to 14.25
Drop forge flashings over 10 in.	14.50 to 15.00
Drop forge flashings under 10 in.	16.50 to 17.00
No. 1 cast	41.00 to 42.00
No. 1 busheling	18.50 to 18.75
Railroad grate bars	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron wheels	37.00 to 38.00

Chicago

CHICAGO, June 22.

Plates.—Some of the Eastern mills which are trying to locate orders for plates in this district are having difficulty in doing so. Consumers are buying comparatively little. The bulk of such business as is being placed comes from car builders, who cannot get full shipments of material on their contracts. The tonnages are not large, being merely for filling in. The Illinois Steel Co. will undoubtedly furnish the steel required for the 2000 to 2500 cars, for which the Elgin, Joliet & Eastern Railroad is inquiring. This material, totaling about 35,000 tons, is now being figured upon. The Pullman Co. has taken orders for 18 passenger cars from the Central Railroad of Georgia and 15 from the Virginian Railway, the total steel requirements being about 600 tons, including 60 tons of axles. There is an inquiry for 8000 tons of steel, mostly plates, for 1000 automobile freight cars. Prices range from 3.50c. to 4c., but the lower quotation is more commonly heard on most current transactions.

The mill quotation is 2.65c. to 4c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.17c. for plates out of stock.

Bars.—Specifications on contracts for bar continue to come in very freely, and new business would be considerable if mills were in a position to promise definite delivery. In most cases, orders being placed on the books are for delivery at mill convenience. Implement manufacturers are among those whose need of bars is exceptionally large. Bar iron demand is good, and mill operations are slightly better. The situation in rail-carbon cars is as previously reported. Prices are firm and without change.

Mill prices are: Mild steel bars, 2.35c. to 4c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.75c. to 4c., Chicago; rail carbon, 3.75c., mill.

Jobbers quote 3.87c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.80c. for rounds and 6.30c. for flats and squares, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. for orders up to 1000 lb.

Structural Material.—Several large building projects which have been reported in recent issues of THE IRON AGE, including a new union station and office building and a new Federal Reserve bank, are apparently being held in abeyance. There is no indication of any resumption of activity in building work. The market, therefore, is extremely quiet and structural shapes are more easily to be had. The Wisconsin Highway Commission has awarded 212 tons to an independent fabricator for a bridge over Black River, Lacrosse County, Wis.

The mill quotation is 2.45c. to 4c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Sheets.—Hot weather last week cut down output of sheets in this district to some extent. There is still a very strong demand for sheets, but less is heard of the exceptional premium prices, which were offered some weeks ago.

Mill quotations are 4.35c. to 6.50c. for No. 28 black; 3.55c. to 6c. for No. 10 blue annealed, and 5.70c. to 8.50c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 7.02c.; No. 28 black, 8c.; No. 28 galvanized, 9.50c.

Wire Products.—A little improvement in shipments is reported by the leading interests, but the shortage of stocks of all wire products in the hands of distributers is still serious. Barbed wire is in demand for fall trade, but the volume of business that is booked will make it difficult for the mills to get it all shipped in the period between now and the time it is most needed by farmers. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 1833.

Cast Iron Pipe.—Brillion, Wis., will take bids up to June 28 on 350 tons of small sizes. The market is dull.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., $79.80; 6-in. and above, $76.80; class A and gas pipe, $2 extra.

Rails and Track Supplies.—Negotiations are still in progress between railroads and the rail mills for rail tonnage for 1921, but it is doubtful whether such business will be booked until later in the year, when the outcome of present operating difficulties may be more clearly seen. The railroads are specifying on their contracts for track supplies.

Standard Bessemer rails, $45 to $55; open hearth rails, $47 to $57. Light rails, 2.45c. to 3.50c. f.o.b. makers' mills.

Standard railroad spikes, 3.55c. to 4c., Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c. f.o.b. makers' mills.

Bolts, Nuts and Rivets.—Railroads and the agricultural implement manufacturers are among the largest buyers of bolts, nuts and rivets, and the demand is active. An Eastern manufacturer, whose prices have been advanced in keeping with those quoted by other makers, has turned down several large orders in the past week, being filled up for the remainder of the year. Other makers are making third quarter contracts at the higher prices which recently went into effect. Output is improved, one plant in this district being on a 100 per cent operating basis. Jobbers have advanced prices in line with the recent advance by manufacturers. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 1833.

Jobbers quote structural rivets, 5.62c.; boiler rivets, 5.72c.; machine bolts up to ¾ x 4 in., 20 per cent off; larger sizes, 10 off; carriage bolts up to ¾ x 6 in., 20 off; larger sizes, 15 off; hot pressed nuts, square tapped and hexagon tapped, 50c. off; coach or lag screws, gimlet points, square heads, 30 per cent off. Quantity extras are unchanged.

Old Material.—A local interest has bought steel scrap in the past week, and a further slight upward tendency in prices on these grades is noted. Buyers believe that the bottom of the market has been reached, and a better buying movement may soon be in evidence.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$34.00 to $35.00
Relaying rails	50.00 to 55.00
Car wheels	35.50 to 36.00
Steel rails, rerolling	32.50 to 33.00
Steel rails, less than 3 ft	26.00 to 26.50
Heavy melting steel	23.00 to 23.50
Frogs, switches and guards, cut apart	23.00 to 23.50
Shoveling steel	22.50 to 23.00
Low phos. heavy melting steel	27.00 to 27.50
Drop forge flashings	19.00 to 19.50

Per Net Ton

Iron angles and splice bars	$30.50 to $31.00
Steel angle bars	22.50 to 23.00
Iron arch bars and transoms	31.50 to 32.00
Iron car axles	39.50 to 40.00
Steel car axles	33.00 to 33.50
No. 1 busheling	18.00 to 18.50
No. 2 busheling	12.50 to 13.00
Cut forge	22.50 to 23.00
Pipes and flues	15.00 to 15.50
No. 1 railroad wrought	25.00 to 25.50
No. 2 railroad wrought	22.50 to 23.00
Steel knuckles and couplers	22.50 to 23.00
Coil springs	24.25 to 24.75
No. 1 cast	35.50 to 36.50
Boiler punchings	23.50 to 24.00
Locomotive tires, smooth	22.00 to 22.50
Machine shop turnings	9.00 to 9.50
Cast borings	12.00 to 12.50
Stove plate	27.50 to 28.00
Grate bars	27.50 to 28.00
Brake shoes	24.00 to 24.50
Railroad malleable	25.50 to 26.00
Agricultural malleable	25.00 to 25.50
Country mixed	15.50 to 16.50

The National Association of Waste Material Dealers, Inc., New York, has sent the following telegram, which is self explanatory, to George B. McGinty, secretary of the Interstate Commerce Commission, Washington, D. C.:

"The St. Louis members of this association, dealing in scrap iron, advise that on an order issued from the Interstate Commerce Commission railroads are refusing to furnish any gondola cars. The nature of the scrap iron business requires the use of these cars for the reason that a very large percentage of all scrap iron is loaded and unloaded by the use of magnets and any other kind of a car is absolutely useless to a scrap iron dealer. This order, if enforced, will mean practically entire suspension of business of these people and will materially prevent delivery of scrap iron to mills. Is there no way that an exception can be made for such parties. Would greatly appreciate wire reply."

BRITISH STEEL INDUSTRY

Task Accomplished Despite Difficulties, But Output is Inadequate

WASHINGTON, June 22.—The British iron and steel industry has accomplished wonders in the face of almost insurmountable obstacles, according to a report on the outlook in the industry by Trade Commissioner Wilbur J. Page, who is at London. It is the general opinion throughout the trade in Great Britain, he says, that it will take some years to make up adequately the shortage in the supply of iron and steel. As a result of the great demand British prices for iron and steel have reached new high levels during the past few months, and the end is not yet in sight.

Mr. Page says that it is hard to judge whether coal or labor is most critical of the problems confronting the industry at the present time. While the production of coal in Great Britain has shown an encouraging increase, the output is still inadequate for needs of the iron and steel trade, and many iron furnaces are on slack blast. Many large concerns are actively taking up the question of acquisition of collieries located conveniently near their blast furnaces and steel plants, so as to assure themselves adequate supplies of fuel. Pig iron cannot be obtained in adequate quantities in Great Britain as yet, but a slight improvement is noted by the importation figures for the last three or four months, which show considerable increases in imports of ore from Spain.

The Labor Problem

The labor problem is a serious one in the iron and steel trades of Great Britain. The working week has been reduced from 54 hours to 47 hours, and a decrease in output appears to be the result. In the South Wales blast furnaces the tonnage men are receiving wages which represent an increase over pre-war wages of 145 per cent. The iron puddlers of the North of England are receiving an advance over pre-war wages representing 167 per cent; of the Midlands, 190 per cent; and of Scotland, 175 per cent. Steel smelters of various districts have received advances ranging from 108 to 133 per cent.

"Statistics show that the 1918 production of pig iron represented 88 per cent of the output in 1913—the last normal year; that of 1919, 72 per cent; that of January, 75 per cent; and March, 1920, nearly 82 per cent," says Mr. Page.

"The figures for the production of steel ingots and castings are even more interesting. The production for March, 1920, amounted to 840,000 tons, and is the highest monthly production since the armistice. On the basis of the output of steel for the first quarter of this year the total production for 1920 would approach 10,000,000 ingot tons. The production of steel ingots and castings for March, 1920, represented an increase over the average monthly production of 1913 of 31 per cent; compared with the average monthly production of 1918—which practically represented the height of war-time activity—an increase of 5 per cent; compared with the 1919 average, an increase of 28 per cent. This increased production of steel for March, 1920, as compared with the production of pig iron, cannot be accounted for by increased imports of pig iron, but is largely due to the utilization of scrap—an economy which was resorted to during the war with great success."

The Railroad Situation

The third great problem which iron and steel trades, in common with all others, have to face is that of transport, Mr. Page says. This is a very serious obstacle, and despite higher wages and slowly increasing supplies of rolling stock the railroad situation is not clearing as rapidly as might be expected. The ocean transport situation is also unsatisfactory.

Commenting on British export trade and American competition, Mr. Page says:

"As for export trade in iron and steel, the British producer is finding domestic demands so insistent that he has neither time nor inclination to give to the development of foreign markets. Machinery and machine-tool manufacturers are using every possible effort to win over the German trade in India and the Dutch East Indies. Considerable efforts are also being made to secure a share of the German business in the South American countries, but the handicaps at home are retarding greatly the present realization of their efforts.

"Generally speaking, the British iron and steel industry is anxious to catch as big a percentage of Germany's pre-war iron and steel export trade, which amounted to about 6,000,000 tons per year, as it possibly can. In its efforts to do this, and in its hopes for the future, it has rather tended to magnify the difficulties which it felt would retard the recovery of the American iron and steel trade. As a result, this recovery has been more speedy than anticipated.

"British iron and steel manufacturers regard the United States as the only possible big competitor in foreign markets for years to come. They hope, with a comparatively favorable labor situation, to increase the British production of pig iron to the record figure of 15,000,000 tons this year, but this figure is excessive, and if a production of 12,000,000 tons is reached, the trade will be doing very well indeed.

"A close study of the situation reveals that the British iron and steel industry has accomplished wonders in the face of tremendous obstacles, and it is safe to guarantee a continued development during this year, provided there are no further serious labor obstacles."

OFFICE CHANGES

Samuel Butler & Co., new and old metals, smelters and refiners, 68 Batterymarch Street, Boston, on and after July 1, will be located in its own building, 421 Old Colony Avenue, South Boston.

The H. L. & W. Sales Co., dealer in jigs, tools, fixtures and dies, has moved from its old location in the Marquette Building, Detroit, to its new plant at 821 West Fort Street. The new building, specially constructed for the use of this company, is equipped with the latest machinery.

The Iron Trade Products Co., Oliver Building, Pittsburgh, dealer in iron, steel, coal, coke and alloys, has opened a branch office in the Greenwood Building, Cincinnati, in charge of C. S. Siebert as district sales manager for that territory.

The Newton Steel Co. is preparing to move its general offices from Newton Falls, Trumbull County, to Youngstown, Ohio, where it has leased the ninth floor of the Wick Building. Edward Ford Clark is president. The company operates a sheet mill at Newton Falls.

George C. Davis, 39 South Tenth Street, Philadelphia, on June 24 removed to 636 Race Street, Philadelphia, after having been at the Tenth Street address for the past 20 years.

Iron Trade Products Co., Farmers Bank Building, Pittsburgh, has opened a branch office at Suite 9, Greenwood Building, Sixth and Vine streets, Cincinnati, with C. S. Siebert in charge as district sales manager. Mr. Siebert has been for some time in the Pittsburgh office, is the son of W. P. Siebert, assistant general manager of sales, Carnegie Steel Co., and will look after business in the Cincinnati territory, including the sale of ores, pig iron, alloys, coal, coke, iron and steel and kindred products.

Briggs & Turivas, iron and steel scrap, have moved their New York office to 2 Rector Street.

The Industrial Engineering Corporation, formerly Butler & Hayes, Inc., has moved to larger quarters in the Industrial Building, Devonshire Street, Boston. F. Albert Hayes is president and Col. Thomas F. Brown is treasurer.

BRITISH STEEL PRICES AT TOP

Poor Fuel Limiting Pig Iron Output—Tin Plates Easier

(By Cable)

LONDON, June 22, 1920.

The scarcity of Cleveland foundry iron is very acute and a resumption of export business is not expected until the output increases, which is still handicapped by irregular supplies of raw material. Quotations for hematite iron are unaltered but an advance is anticipated. Export business is reduced, owing to heavy home demand, and production is decreasing because of the poor quality of fuel.

Some steel makers are quoting on suitable export specifications for angles, and up to £40 has been asked for plates. The Continent is hesitating to purchase owing to the high prices asked.

There is a general feeling here that steel prices have reached the top. The tin plate market is easier, with 20 x 28 sold at 141s. f.o.t., June shipment, and 14 x 20 at 68s. f.o.t., for August-September delivery. Quarter wasters have been sold at 60s. f.o.t. for prompt home and foreign delivery. Consumers, however, are withholding purchases on the expectation of lower prices.

We quote per gross ton except when otherwise stated, f.o.b. maker's works, with American equivalent figured at $4 for £1, as follows:

Ship plates	26	0 to 34	0	$104.00 to $136.00
Boiler plates	28	10 to 37	0	112.00 to 148.00
Tees	20	10 to 33	0	82.00 to 132.00
Channels	25	15 to 33	5	103.00 to 133.00
Beams	25	10 to 32	0	102.00 to 128.00
Round bars ¾ to 3 in.	28	0 to 33	10	112.00 to 134.00
Rails, 60 lb. and up	23	0 to 25	0	92.00 to 100.00
Billets	26	10 to 27	10	106.00 to 110.00
Sheet and tin plate bars, Welsh	25	0 to 32	0	100.00 to 128.00
Galvanized sheets, 24 g.	55	0 to 60	0	220.00 to 240.00
Black sheet, 24 g. to 26 g.	50	0 to 54	0	200.00 to 216.00
Tin plate, base box*	3	11		14.20
Steel hoops	38	15 to 39	0	155.00 to 156.00
Cleveland basic iron	11	7½		45.50
West Coast hematite	14	15		59.00
Cleveland No. 3 foundry (export to allies)	10	5		41.00
Ferromanganese	35	0 to 40	0	140.00 to 160.00
Coke	3	2¾		12.55

*Prompt delivery; for Aug.-Sept., 68s. ($13.60) Last quarter, 67s. 6d. ($13.55.)

Cancellations of Shipbuilding Orders—Wire Rods from Australia—Arnold's New High Speed Steel

LONDON, ENGLAND, June 7.—The markets still keep up a strong appearance owing to the stringency of supplies of nearly every kind. However, owing to the distinct weakness in the markets for non-ferrous metals and indeed other articles, doubts are beginning to be felt as to whether iron and steel can withstand the generally downward tendency. At the moment the demand is in excess of supplies and for that reason sellers seem confident that there is no downward movement yet in sight. What may however eventually prove to be a factor of considerable importance is that there is now a tendency to cancel shipbuilding orders. Many of these contracts were placed on what is commonly known as "time and line" terms, which is to say, actual cost plus a fixed percentage of profit to the shipbuilder. These are the orders which a desire is now being shown in some quarters to cancel. It will take a long time perhaps before this has any effect, but it must sooner or later reduce the demand for plates and therefore ease the position of supplies of every description.

Pig iron continues very firm and scarce and, in view of the urgency of home demands, very little metal is available for export. Indeed producers are turning down practically all export inquiries. There is, however, a noticeable tendency for foreign inquiries to taper off, buyers there being only too conscious of the extraordinarily high level of prices now ruling and hence not quite so keen to purchase. Even at home, however, traders are beginning at last to realize that prices of pig iron have reached a dangerously high level, and a movement downward would not cause much surprise. Prices of Cleveland iron are meantime unchanged at 230s. for No. 1 and 217s. 6d. for No. 3 G. M. B., with a premium of 5s. more for shipment to France, Belgium and Italy. It was expected that a revision in prices, probably upward, would take place at the end of May, but so far no change is announced.

As regards East Coast hematite it is now almost as scarce as Cleveland foundry iron. Producers are well booked and not keen for further contracts. Buyers still find considerable difficulty in getting their orders booked even for home consumption and as regards overseas business only a few odd lots have been done.

With reference to steel, a little more semi-finished material is offered from America. Some offerings from Belgium of one or two descriptions of finished steel at prices below British quotations have appeared. A recent entry in the import returns here is remarkable, this being the reported arrival of about 500 tons of wire rods from Australia.

On the Clyde 23 vessels with a gross tonnage of 61,501 tons were launched during May. This makes the total launchings for the first five months of the year 238,013 tons, compared with 120,885 tons for the same period of last year. In spite of a period of unexampled briskness the Clyde shipyards and engineering shops are reported to be experiencing a considerable amount of unemployment. This is owing to the serious shortage of raw materials. The yards have all an exceptional amount of work on hand, and although inquiries for new tonnage are not very impressing the orders on hand are sufficient to keep the majority of the yards working for a very considerable time ahead; in some quarters it is put at two or three years.

The tonnage launched this year is the third highest for the period during the last 20 years. As it is, however, thousands of engineers on the Clyde are idle and many others working short time. It is stated that the post-war development of industry in the Clyde area would have necessitated a 20 per cent expansion in the pre-war supply of coal, and for lack of this there is a serious shortage in the supplies of raw material. Indeed, so serious is the state of affairs that many establishments are working two shifts only in place of the usual three in the shipyards. Progress all over is being kept back owing to the shortage of steel plates, and in many cases orders are considerably behind time. According to an important shipbuilder supplies of raw material in many instances are 50 per cent short of what could be utilized.

It is reported that Dr. J. O. Arnold has sold his production rights in the new high speed steel to J. D. Moffat, one of the directors of Sir Thomas Salter Pyne & Co., and that the new steel is to be made in Sheffield.

FRENCH OUTPUT INCREASING

Now at Highest Point Since the Armistice—Coal Mining Resumed

(Special Correspondence)

PARIS, FRANCE, June 1.—With improvement not only in the labor situation but also in coal and coke, the outlook in iron and steel at the beginning of June seems much better. Relations between employers and employees have not been entirely settled, notably at Hagondange, nevertheless this is only a matter now of detail. The recent strikes have permitted accumulation of coke, and a number of blast furnaces have now been put into operation, including four at Hagondange, five at Rombas-Maizieres and four at Knutange. Production on the whole has never been as much since the armistice.

Further increases in the capital stock of various companies are announced. The latest was Acieries et Forges de Firminy, whose stockholders voted to double the present capital of 20,000,000 francs. At the stockholders' meeting it was stated that the principal Firminy plant is operating at full capacity with 5000 men,

and that the Dunes plant will be doing likewise next year. The business being done was stated to be 10,000,000 francs a month.

At the forthcoming meeting of the Ateliers de Construction du Nord de la France the proposal will be considered of absorbing the Societe de Blanc Misseron, which is a builder of locomotives. During 1912 and 1913 the company turned out 27 locomotives. It hopes now to build regularly 80 to 90 locomotives each year.

During the first ten days of May Germany delivered to France 194,364 tons of coal and 97,881 tons of coke. During the second ten days the delivery of coal was 151,265 tons of coal and of coke 91,127 tons. It is known that under the Versailles treaty France can demand the delivery of metallurgical coke to the extent of three tons instead of four tons of coal. Since May 25 work has been entirely resumed in the mining basins. The strike affected 120,000 miners, and wages lost by them, according to estimates, were approximately 40,000,000 francs. Production, it is estimated, decreased 782,000 tons.

Prices fixed by the Comptoir de Longwy for pig iron for June are, in francs:

	No. 3	No. 4	No. 5
Smooth (peau lisse).....	650	600	620
Rough (peau rugueuse).....	600	597	594

Beams are quoted at 1195 francs; rails, 1225 francs; large sheets, 138 francs; merchant iron, first class, base, 145 francs.

JAPAN FORMS SYNDICATE

Importers to Buy Resale Material—Plates, Bars and Pig Iron Bought by Europe

What promises to be a strong stabilizing influence in the Japanese market is the formation of a syndicate of about 15 importing firms and steel merchants of Japan, for the purpose of purchasing resale material being offered by weak holders at what is in many instances one-half the former market price. The syndicate announces that it will place no orders abroad before Aug. 15. Included in this association of companies are: Mitsui & Co., Mitsubishi Goshi Kaisha, Iwai & Co., Yuasa Trading Co., Masuda & Co., Mogi & Co., Sazuki & Co., Sale-Frazer, Takata & Co., Yonei & Co., Asano & Co., and several steel merchants of Tokio. The executive committee consists of Mitsui & Co., Mogi & Co., Masuda & Co., Iwai & Co., and five Tokio steel merchants. Cancellations are still being received and material being shipped c.i.f. Japan has been offered to Australia and the Dutch East Indies.

England and France are still buying heavily of plates and shapes despite recent rumors of a falling market in the United States and inquiries for pig iron continue to come from all European markets, sales being reported to Sweden, Holland, Belgium and England. The latter is a good buyer of bars, the market price of which is sufficiently high in England to enable exporters to fill orders under the prevailing quotations on both bars and plates. An export company in New York recently shipped 6500 tons of plates and shapes and has orders booked for more than 15,000 tons of plates, besides a heavy tonnage of pig iron and bars for England. Sweden is buying small quantities of wire rods and pig iron, the largest shipment of wire rods reported within the past week being 300 tons.

The Dutch East Indies continues active. An exporter to this market in the past fortnight has shipped about 700 tons of 20-lb. to 40-lb. rails and several small orders of structural steel have been placed. Inquiries and small orders from South America and Cuba continue brisk, particularly for hand-power cranes and hoists.

IRON AND INDUSTRIAL STOCKS

Public and Professional Buying Is on a Small Scale

Prices for iron and industrial stocks have continued to move irregularly with the advantage, if there is any, on the up side. The outstanding feature during the past week has been the diminishing interest shown in securities by the public and professional trader alike. The one most favorable thing that can be said about the securities market is that presentation of bearish arguments has failed to force values down. It is equally true, however, that bullish developments have failed to put values up to a noticable degree. To be just, the very best that can be said of the market is that it is marking time.

Everybody naturally interested in securities apparently is waiting for two things—encouragement to business interests from the Federal Reserve Bank and the outcome of the Convention in San Francisco. Concrete results from one or both should lift the securities market from its inactivity. The apparent disregard of the Crucible Steel Co. 16 2/3 per cent stock dividend, the purchase of 75,000 tons of copper by French consumers, the declaration of the regular Northern Pacific Railroad dividend contrary to general expectation, the heavy foreign business being booked by the Baldwin Locomotive Works and the generally brighter outlook for equipment-making companies, prove that politics and credits are the dominating factors in the market for iron and industrial securities.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	37 - 41	Lackaw. Steel.....	70 - 72
Am. Can com.....	39½ - 40¾	Lake Sup. Corp...	13¼ - 13½
Am. Can pf.....	90¼ - 91½	Midvale Steel.....	40⅝ - 42⅜
Am. Car Fy. com.	136¼ - 139⅝	Nat.-Acme	— - 34⅛
Am. Car Fy. pf...	— -108	Nat. E. & S. com.	67½ - 69
Am. Loco. com...	95¾ - 98½	N. Y. Air Brake..	— - 93
Am. Loco. pf.....	99¾ -101	Nova Scotia Steel.	52 - 54
Am. Radiator com.	— -104¼	Press. Steel com..	97½ - 99⅛
Am. Steel F. com.	38½ - 39½	Ry. Stl. Spg. com.	95½ -100
Bald. Loco. com..	116 -119⅞	Ry. Stl. Spg. pf...	— -100
Bald. Loco. pf....	97½ - 97¾	Replogle Steel....	79½ - 86½
Beth. Steel com..	87 - 88½	Republic com.....	90⅝ - 93⅝
Beth. Stl., Cl. B..	88⅝ - 92	Republic pf.....	— - 94⅞
Beth. Stl., 8%....	107 -107½	Sloss com.....	65 - 72¼
Case, J. I., pf.....	— - 94	Superior Steel.....	— - 50
Chic. Pneu. Tool..	88⅞ - 99¼	Transue-Williams.	51 - 56
Colorado Fuel.....	32 - 32½	Un. Alloy Steel...	— - 43
Cruc. Steel com..	137½ -146	U. S. Pipe com...	16 - 16¼
Cruc. Steel pf....	— - 94	U. S. Steel com...	91¾ - 93¾
General Electric..	140½ -143	U. S. Steel pf.....	104⅞ -105½
Gt. No. Ore Cert..	35½ - 35⅞	Vanadium Steel...	82⅝ - 87¼
Gulf States Steel.	60¼ - 61½	Va. I. C. & Coke..	109⅞ -116
Int. Har. com.....	131½ -133	Westingh. Elec...	49 - 49⅞
Int. Har. pf.....	— -106		

Will Build Blast Furnace and Steel Plant in Michigan

The American Iron & Steel Corporation, Engineer's Building, Cleveland, announces that it has acquired a site near Michigan City, Ind., with a frontage on Lake Michigan and will shortly begin the erection of a steel plant which will include a blast furnace, six open-hearth furnaces and a 12-mill sheet plant. The company also announces that later it will install a tube mill and various other finishing mills.

The company is chartered in Delaware with $50,000,000 authorized capital stock and is a subsidiary of the Lake Superior Iron Ore Co., Cleveland, organized about a year ago to develop ore properties in the Minnesota ranges and in Canada. It announces that it will build three 12,000 ton boats for carrying ore to its plant. Those named as being interested in the corporation include F. W. Wheeler, president Saginaw Ship Building Co., Saginaw, Mich.; L. L. Knox and E. E. Slick, Pittsburgh, respectively president and chairman of the directorate of the Slick-Knox Co., and other Pittsburgh, Cleveland, Chicago and Detroit men.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound For Early Delivery

	Copper New York			Lead		Zinc	
June	Lake	Electrolytic	Tin New York	New York	St. Louis	New York	St. Louis
16	19.00	19.00	45.50	8.50	8.25	7.85	7.50
17	19.00	19.00	46.50	8.25	8.00	7.85	7.50
18	19.00	19.00	48.00	8.15	7.90	7.70	7.35
19	19.00	19.00	....	8.15	7.90	7.70	7.35
21	19.00	19.00	49.37½	8.15	7.90	7.75	7.40
22	19.00	19.00	50.00	8.15	7.90	7.80	7.45

NEW YORK, June 22.

Demand is very light for all the metals with prices low in one or two cases. The copper market is unchanged both as to prices and demand. The tin market has advanced, due to a stronger market in London. The lead market has experienced considerable of a decline and there is no urgent demand. There has been no change in the zinc market except a slightly lower level of prices. Antimony is a little easier.

Copper.—There has been no change for the better in this market either as to demand or prices. The recurrence of railroad labor troubles, particularly around Baltimore, is not an encouraging symptom and may result in the closing of one or two large refineries. This will only aggravate an already unfavorable situation both as to production and shipments. The large producers are still firm in their idea of prices, both electrolytic and Lake being quoted at 19c., New York, for delivery in the next two months. They see no reason why their prices should be changed. Some of the smaller producers and other interests are offering electrolytic copper as low as 18.25c., New York, but demand for this is exceedingly light and either level of quotations is largely nominal.

Tin.—Despite a general surface appearance of quietness throughout the market there has evidently been a fair amount of tin sold. Consumers have bought a portion of this but dealers have been the largest participants. It is understood that one large consumer was inquiring for 200 tons last Thursday and that the order was placed. Last week, Wednesday, June 16, about 225 tons was sold on the New York Metal Exchange, 200 tons of this being Straits tin for July shipment and some for shipment from the Far East, sales ranging from 45c. to 45.25c. There was one lot of 25 tons of Chinese tin for shipment from the East which was sold at 42.12½c., it being understood that this sale was forced because of inability to protect a margined account. Last Saturday there was an active demand for future shipment but there appeared to be a lack of sellers and very little business was done at bids of 47.75c. to 48c. The market appears to have reached its low point on this movement at 45.50c. a week ago and has been on a continual rise since, spot Straits, New York, being quoted at 50c. to-day, but nominal. The principal reason is a much stronger market in London, spot Straits being quoted there to-day at £270 per ton. With London advancing it is expected that good buying will develop on this side. Arrivals thus far this month have been 2695 tons, with 4430 tons reported afloat.

Lead.—The feature in this market has been the reductions made by the American Smelting & Refining Co. on two successive days. Late on Tuesday, last week, this company reduced its price to 8c., St. Louis, or 8.25c., New York, and on the next day again revised its quotation downward to 7.75c., St. Louis, or 8c., New York. The outside market has met these reductions but is still slightly above these quotations to-day, being 7.90c., St. Louis, or 8.15c., New York, for early delivery. The reasons for the decline are dullness on this side and the slump in the British market about a week ago, as well as the desire to forestall imports of the metal. Lead is not plentiful for spot or early shipment from the West, nor is there any urgent demand.

Zinc.—Conditions in this market are unchanged. Values fell to slightly lower levels during the week when 7.35c., St. Louis, was the quotation on Friday and Saturday, but since then the market has strengthened slightly, because of better prices in London, until to-day prime Western for delivery in the next two months is quoted at 7.45c. to 7.50c., St. Louis, or 7.80c. to 7.85c., New York. Selling by producers is still of the hand-to-mouth order and buying by galvanizers is at a low ebb because of the uncertainty as to the future.

Antimony.—This market is quiet and inactive with wholesale lots for early delivery quoted at 7.75c., New York, duty paid.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, for early delivery, are quoted at 33c., New York, by the leading interests, and 31.50c. by other sellers.

Old Metals.—This has been another quiet week with values slightly lower and very little business transacted. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper heavy and crucible	18.25
Copper, heavy and wire	17.25
Copper, light and bottoms	15.00
Brass, heavy	13.00
Brass light	8.50
Heavy machine composition	17.75
No. 1 yellow rod brass turnings	10.50
No. 1 red brass or composition turnings	15.00
Lead, heavy	7.75
Lead, tea	6.00
Zinc	5.75

Chicago

JUNE, 21.—The non-ferrous markets are quiet with a tendency toward lower values in copper, lead and spelter. Lower prices are being offered for old metals. We quote Lake copper at 19c. to 19.25c. in carload lots; tin, 51c. to 52c.; lead, 8.37½c.; spelter, 7.60c.; antimony, 9c. On old metal we quote copper wires, crucible shapes, 13.25c.; copper clips, 13.25c.; copper bottoms, 11.25c; red brass, 13.75c.; yellow brass, 9c.; lead pipe, 6.50c.; zinc, 4.25c.; pewter, No. 1, 25c.; tin foil, 35c.; block tin, 40c., all these being buying prices for less than carload lots.

St. Louis

June 19.—General lack of interest is displayed in the non-ferrous metals. Outside of the paint and storage battery people, lead users are quiescent, and the market is weak and lower. Early in the week small lots sold at from $8.50 to $8.65, but the reduction in its price by the leading interest to 7.75c. was followed by the independents, and that quotation prevailed at the close. Spelter was also easier, closing at 7.50c., against 7.55c. to 7.60c. the week before. In a small way there is a brisk inquiry for tin, copper and antimony. In less than car lots the following quotations prevail: Lead, 8.50c.; spelter, 7.50c.; tin, 60c.; copper, 19.50c.; antimony, 10c. Latest advices from the Joplin district report ores about steady, with a somewhat more active demand than heretofore. First grade zinc, $45; second grade, $43.50 to $45; calamine, $35 to $37.50; lead, $100. On miscellaneous scrap metals we quote dealers' buying prices about as follows: Zinc, 4.50c.; heavy yellow brass, 10c.; heavy red brass, 14c.; heavy copper and copper wire, 14c.; light copper wire, 11.50c.; pewter, 25c.; tinfoil, 38c.; lead, 6.50c.; tea lead, 3c.; aluminum, 20c.

The Service Casting Co. has recently been organized at Blanchester, Ohio, and will specialize in making small grey iron castings for the trade. The foundry has been in operation since Feb. 1, 1920, doing contract work. The personnel consists of R. B. Huyett and Charles N. Secrist, both of experience in foundry and machine practice.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, with revisions effective from Jan. 1, 1920, in carload lots, to points named, per 100 lb., are as follows:

New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23½c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; all in carloads, minimum 36,000 lb. To Denver the rate is 99c., minimum carload 40,000 lb.; Omaha, 59c., minimum carload 36,000 lb.; New Orleans, 38½c.; minimum carload 36,000 lb.; Birmingham, 57½c., minimum carload 36,000 lb. To the Pacific Coast the rate is $1.25 per 100 lb. on articles of iron and steel, minimum carloads 80,000 lb., while the structural steel rate is $1.25, minimum carload 50,000 lb., or $1.315, minimum carload 40,000 lb. The rate on ship plates, Pittsburgh to Pacific Coast, is $1 per 100 lb., minimum carload 80,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 56c., to St. Paul, 49½c.; to Denver, 99c.; to Omaha, 56c., all in carload lots, minimum 46,000 lb. To Jacksonville, Fla., all rail carloads, 41½c., minimum 36,000 lb., less than carloads, 59c.; rail and water, carloads 34½c., minimum 36,000 lb.; less than carloads 46½c. On iron and steel items not noted above, the rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 4c.

Wire Products

Wire nails, $3.25 to $4 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2. Bright basic wire, $3 to $3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3 to $3.50; galvanized wire, $3.70 to $3.95; galvanized barbed wire and fence staples, $4.10 to $4.45; painted barbed wire, $3.40 to $3.75; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets	$4.50 base
Large boiler rivets	4.60 base
Small rivets	40 per cent off list
Small machine bolts, rolled threads	40 and 5 per cent off list
Same sizes in cut threads	40 and 10 per cent off list
Longer and larger sizes of machine bolts	30 per cent off list
Carriage bolts, ⅝ in. x 6 in.:	
Smaller and shorter, rolled threads	30 and 10 per cent off list
Cut threads	30 per cent off list
Longer and larger sizes	25 per cent off list
Lag bolts	45 per cent off list
Plow bolts, Nos. 1, 2 and 3 head	40 per cent off list
Other style heads	20 per cent extra
Machine bolts, c.p.c. and t. nuts	
Smaller and shorter	30 per cent off list
⅝ in. x 4 in.:	
Longer and larger sizes	20 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts	$1.50 off list
Tapped nuts	$1.00 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:	
⅝-in. and larger	50 and 10 per cent off list
9/16-in. and smaller	50 and 10 per cent off list
9/16-in. and smaller, A. L. A. M. or S. A. E.,	70, 10 and 5 per cent off list
Stove bolts in packages	70 and 10 per cent off list
Stove bolts in bulk	70, 10 and 2½ per cent off list
Tire bolts	55 and 10 per cent off list
Track bolts	6c. base

One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $70; chain rods, $75 to $80; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, $4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ⅝-in. and 7/16-in., $4.25; 5/16-in., $5; track bolts, $4.90 to $5. Boat and barge spikes, $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating I.C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	1	+25
½	51	36½	⅜	25½	+ 1½
¾ to 3	54	41½	½	29½	11½
			¾ to 1½	34½	18½
			2 and 2½	33½	17½

Lap Weld

2	47	34½	1¼	24½	9½
2½ to 6	50	37½	1½	31½	17½
7 to 12	47	33½	2	28½	14½
13 and 14	37½		2½ to 6	30½	17½
15	35		7 to 12	27½	14½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	¼	+7	+40
½	48	35½	⅜	23½	6½
¾ to 1½	52	39½	½	28½	15½
2 to 3	53	40½	¾ to 1½	34½	19½
			2 and 2½	34½	19½

Lap Weld, extra strong, plain ends

2	45	33½	1½	27½	13½
2½ to 4	48	36½	2	29½	16½
4½ to 6	47	35½	2½ to 4	31½	19½
7 to 8	43	29½	4½ to 6	30½	18½
9 to 12	38	24½	7 to 8	22½	10½
1¼	21½	6½	9 to 12	17½	5½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	1¾ and 1⅞ in.	+20
2½ to 3¼ in.	30½	2 and 2¼ in.	+10
2½ in.	24	2½ and 2¾ in.	+1
1¾ to 2 in.	19½	3 and 3¼ in.	— 1½
		3½, 4 and 4½ in.	— 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅞ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

Blue Annealed—Bessemer

	Cents per lb
No. 8 and heavier	3.50 to 5.95
Nos. 9 and 10 (base)	3.55 to 6.00
Nos. 11 and 12	3.60 to 6.05
Nos. 13 and 14	3.65 to 6.10
Nos. 15 and 16	3.75 to 6.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15 to 6.30
Nos. 22 to 24	4.20 to 6.35
Nos. 25 and 26	4.25 to 6.40
No. 27	4.30 to 6.45
No. 28 (base)	4.35 to 6.50
No. 29	4.45 to 6.60
No. 30	4.55 to 6.70

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70 to 7.50
Nos. 12 to 14	4.80 to 7.60
Nos. 15 and 16	4.95 to 7.75
Nos. 17 to 21	5.10 to 7.90
Nos. 22 to 24	5.25 to 8.05
Nos. 25 and 26	5.40 to 8.20
No. 27	5.55 to 8.35
No. 28 (base)	5.70 to 8.50
No. 29	5.95 to 8.75
No. 30	6.20 to 9.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15 to 6.15
Nos. 17 to 21	4.20 to 6.20
Nos. 22 to 24	4.25 to 6.25
Nos. 25 to 27	4.30 to 6.30
No. 28 (base)	4.35 to 6.35
No. 29	4.40 to 6.40
No. 30	4.40 to 6.40
Nos. 30½ and 31	4.45 to 6.45

PERSONAL

ALLAN E. GOODHUE

The Chicago Pneumatic Tool Co., Chicago, announces the election of Allan E. Goodhue as vice-president in charge of sales. Mr. Goodhue since May 1, 1919, has been managing director of the company's English subsidiary, the Consolidated Pneumatic Tool Co., London, England; also director of European sales for the Chicago Pneumatic Tool Co. For a number of years he was with the sales department of the Midvale Steel Co. and Midvale Steel & Ordnance Co. in Philadelphia, Chicago and Boston, leaving that company in March, 1918, to enter the service of the Government. From that time until Jan. 1, 1919, when he became connected with the Chicago Pneumatic Tool Co., he was assistant manager of the steel and raw material section, production division, of the Emergency Fleet Corporation. Mr. Goodhue sails for New York on the Olympic and is scheduled to arrive in New York about July 3.

Eugene H. Welker has been elected president of the Michigan Nickel Supply Co., Inc., 66 West Larned Street, Detroit, succeeding David H. Creider, resigned. A. M. Welker has been elected vice-president of the company, and M. A. Morgner, secretary-treasurer.

George M. Berry has resigned as assistant commercial manager of the Willys-Overland Co., Toledo, Ohio, and on July 1 will become vice-president and general manager of the Stevens-Duryea Co., Chicopee Falls, Mass.

Stockholders of the Curran-Detroit Radiator Co., Detroit, at a special meeting June 12, increased the number of directors, electing William J. Murray and Edwin P. Harms, the latter of the Detroit Vapor Stove Co., to the board.

Albert Walton, Philadelphia, who has been industrial engineer and production expert for several large manufacturing corporations, has been appointed general works manager of Bateman & Companies, Inc., a recent consolidation of a number of well-known agricultural implement manufacturers. His headquarters will be in New York.

Howard Charnell, formerly with the Lucey Mfg. Corporation's Pittsburgh office, has become associated with the Oil Well Supply Co., Pittsburgh, with complete supervision of its purchasing department.

W. C. Schrage, who started with the Pittsburgh Shafting Co., Detroit, 15 years ago as a bookkeeper, has been elected president of the company. Thomas H. Booth has been elected vice-president and cashier.

Klaus Sollie has assumed his duties as chief engineer of the Youngstown Sheet & Tube Co., Youngstown, Ohio, succeeding William Forsstrom, resigned to become identified in a similar capacity with the Wisconsin Steel Co. at South Chicago, Ill., a subsidiary of the International Harvester Co. Mr. Forsstrom was chief engineer of the Sheet & Tube company for three years, coming from the La Belle Iron Works at Steubenville, Ohio, where he had been similarly employed for 14 years. Mr. Sollie has been chief draftsman of the Sheet & Tube company for the past three months and was formerly engineer in charge of development of the Buckeye Coal Co., a subsidiary operating at Nemacolin, Pa. Mr. Forsstrom will assume his duties with the Wisconsin Steel Co. on July 1 and in the meantime is visiting in the South.

At the annual meeting of the Bridgeport Rolling Mills, Inc., Bridgeport, Conn., the following officers were elected: President, William R. Bull; vice-president and works manager, George D. Stearns; secretary-treasurer, Anton C. Raffauf. Capacity has been increased one-third. A new 18-in. x 30-in. rolling mill has been added.

B. G. Koether, formerly of Detroit, who early this year was made vice-president of the Hyatt Roller Bearing Co., in charge of sales and advertising, has been made assistant general manager of the Hyatt division of the General Motors Corporation.

E. M. Colquhoun, Middletown, Pa., has been elected president of the new Enduro Porcelain Enameling Co., Middletown, Pa., which is connected with the Middletown Car Co. Other officials elected by the organization include A. W. Brehman, Philadelphia, vice-president; James G. Balfour, Philadelphia, secretary-treasurer. All machinery purchased by the new company is to be delivered before July 1 and it is expected that operations will be started about Sept. 1.

Alois Hauser has been appointed assistant to the works manager, in charge of engineering, of the Timken Roller Bearing Co., Canton, Ohio. For the past several years Mr. Hauser has been efficiency engineer at the Saucon plant, Bethlehem Steel Co.

E. J. Boggan recently resigned as factory manager of the U. S. Metal Goods Co., Cleveland, to enter the executive organization of the Dittmer Gear & Mfg. Corporation, Lockport, N. Y., in the capacity of sales engineer. He was formerly with the Frontier Chuck & Tool Co., as sales engineer; also with the King Sewing Machine Co., Buffalo, as time study and efficiency engineer. He also served the Covert Gear Co., Lockport, as production manager, and the Harrison Radiator Corporation in the same capacity.

A. F. Stirling Blackwood has resigned as vice-president, general manager and director of the Union Steel Casting Co., Boston, and has sold his interest in the company. He has organized a new company to make steel castings by a new process of melting.

H. B. Van Pelt, who has been with the Columbia Steel & Shafting Co. and the Pittsburgh Shafting Co. for about 10 years, the last four years as vice-president and manager of sales of the Pittsburgh Shafting Co., Detroit, is leaving this organization, having purchased its stock of seamless and welded tubing, and will establish himself, with his son, Donald C. Van Pelt, in business, as the Steel Service Co., Rivard and Maple streets, Detroit.

W. C. Buell, sales manager Diamond Machine Co., Providence, R. I., has sailed for Europe for an absence of a month or longer.

At a special meeting of the board of directors of S. K. F. Industries, Inc., New York, the resignation of B. G. Prytz, as president, was accepted, Mr. Prytz having been elected managing director of the parent company, with headquarters at Gothenburg, Sweden. F. B. Kirkbride, vice-president since the organization of the company, was elected president to succeed Mr. Prytz.

R. J. Ehrhart has been placed in charge of the new St. Louis office of the Electric Controller & Mfg. Co., Cleveland. His address will be Room 1106, 208 North Broadway, St. Louis.

William L. Brown, F. R. Phillips & Sons Co., iron and steel merchants, Pennsylvania Building, Philadelphia, sailed for Europe June 21 to visit the company's offices in London, England, and Milan, Italy. The American branch offices are in New York and Pittsburgh.

Commander R. D. Gatewood, of the Construction Corps, U. S. Navy, has been selected by Chairman Benson as Director of Construction and Repair of the Emergency Fleet Corporation, relieving R. L. Hague, of San Francisco. Commander Gatewood was gradu-

ated from the Naval Academy in 1903 and from the post graduate course of naval architecture and marine engineering at Massachusetts Institute of Technology in 1906. He has been in charge of repairs and new construction on both the Atlantic and Pacic coasts and for two and one-half years was fleet constructor of the North Atlantic fleet. During the war he was superintendent of motive power for the Panama railroad in charge of the large shops and drydocks at both ends of the Isthmus and made an enviable record in connection with extensive repair and refitting work on merchant vessels. Commander Gatewood's main office will be in Washington. His New York office will be at 45 Broadway.

Walter B. Enck, vice-president Donner Steel Co., Inc., Buffalo, has resigned to become vice-president of the International Fuel & Iron Corporation. He will assume his new duties July 1 with headquarters in Philadelphia.

Raymond H. Allen has been appointed director of purchases of Dodge Brothers, Detroit, automobile manufacturers.

D. T. Croxton, manager of the pig iron department, and Allen H. Hopper, of the iron ore sales department, of the Cleveland Cliffs Iron Co., will have general supervision of the erection of the new blast furnace to be built by the Trumbull-Cliffs Furnace Co., in Warren, Ohio. Their office with the engineering department of the new furnace company is in the Kirby Building, Cleveland.

Dan A. Stuart, formerly district sales manager Sizer Forge Co., Pittsburgh, has been made general manager of sales of the West Penn Forge Co., 990 Union Arcade, Pittsburgh.

Elton B. Hull, formerly general superintendent of the Toledo Furnace Co., Toledo, Ohio, has been appointed manager of the blast furnace department of Pickands, Mather & Co., with headquarters at Cleveland. John S. Crowther, Jr., has succeeded Mr. Hull as general superintendent of the Toledo furnaces, and M. D. Curran has been appointed assistant general superintendent.

New Method of Determining Carbon in Iron

The ordinary method of determining carbon in iron and steel consists in burning the sample with free oxygen, absorbing the CO_2 by means of KOH and weighing the KOH bulb before and after. In order to eliminate the errors due to absorption and weighing, a new method substitutes freezing out the CO_2 with liquid air and allowing it to expand into a known volume and noting the increase in pressure. In order to differentiate between the carbon existing as absorbed CO or CO_2 and that existing in combined form, the method involves two heatings, one to 600 deg. C. in vacuo, and the other to 1000 deg. or higher in oxygen. Extra precautions are also taken to eliminate errors due to other sources, so that by this method carbon can, if necessary, be determined with an accuracy of ± 0.0001 per cent. This new method was presented as a paper, "Carbon in Iron," by T. D. Yensen, Westinghouse Research Laboratory, East Pittsburgh, Pa., at the annual spring meeting of the American Electrochemical Society at Boston in April.

Bibliography on Electric Furnaces

"The Electric Furnace as Applied to Metallurgy" is the title of a bibliography prepared by Clarence Jay West of Arthur D. Little, Inc., Cambridge, Mass. It was presented as part of the program of the annual spring meeting of the American Electrochemical Society at Boston in April and is now to be had in pamphlet form. It is a reading list of the literature on the construction and operation of the electric furnace as applied to the metallurgy of iron and steel and the nonferrous metals.

The Electric Furnace Construction Co., Philadelphia, reports an order for a 1-ton Greaves-Etchells furnace for the Buenos Ayres Western Railway, Ltd.

OBITUARY

WHITFIELD P. PRESSINGER, New York, vice-president Chicago Pneumatic Tool Co., died June 10 of complications following an operation. He was engaged in the pneumatic tool and allied machinery industry for many years. He was general manager of the Clayton Air Compressor Co. for seven years, and became widely known through numerous activities in the American Society of Mechanical Engineers and the Compressed Air Society. He was born in New York in 1871. He was a member of the Engineers' Club and the Machinery Club, New York.

CHARLES SEELBACH, president Forest City Foundry & Mfg. Co., and the Walworth Run Foundry Co., Cleveland, died June 15 after a several months illness, aged 57 years. He had been with the Forest City Foundry since its organization in 1890, starting as secretary and treasurer, and had been president of the company since 1912. He was very active in foundry association work and was the first president of the Founders Association of Cleveland and for several years one of the vice-presidents of the National Founders Association.

CHARLES BLIZARD, third vice-president Electric Storage Battery Co., Philadelphia, died June 12. He was graduated from the Brooklyn Polytechnic Institute, and became manager of the New York office of the Electric Storage Battery Co. in 1893. He received his present title in 1906.

JOHN S. NAYLOR, superintendent shear department, Falcon Steel Co., Niles, Ohio, was instantly killed June 14, when crushed beneath a hoisting block, which fell from the hoisting crane when the supporting chains broke. He was mayor of Niles for three consecutive terms.

CHARLES H. VINAL, construction manager Allis-Chalmers Mfg. Co., Milwaukee, died suddenly at his summer home at Little Muskego Lake, June 12, at the age of 61 years. He was born in Keokuk, Iowa, Sept. 10, 1858, and received his education in Massachusetts.

MAX ZALK, senior member of Duluth Iron & Metal Co., Duluth, Minn., died on Saturday, June 12.

Low Output in Swedish Steel Industry

The extent to which strikes and lock-outs this year have affected adversely the iron and steel industry of Sweden is revealed by the returns for the first quarter of 1920 as compared with those for 1919. The pig-iron production to April 1, 1920, has been only 74,300 tons, as compared with 159,700 tons to April 1, 1919, the February, this year, output having been only 7700 tons. The open-hearth steel output for the first quarter this year was only 51,000 tons, against 115,300 tons in the first quarter of 1919, last February's output having been only 1600 tons.

Steel gauze is better than brass or copper gauze for miners' flame safety lamps, according to a series of investigations made by the Bureau of Mines, Washington.

The Keystone Steel Co., 997 Union Arcade Building, Pittsburgh, has just been organized to do a general brokerage business in iron and steel products, such as bars, plates, sheets, wire, etc. The management of the new firm is in charge of A. Cohen, until recently Pittsburgh district representative for the Carnick Bros. Co., Youngstown, Ohio, iron and steel scrap and relaying rails.

"The Future of the Lake Superior District as an Iron Ore Producer," by Edward W. Davis, is the title of a bulletin of the University of Minnesota, Vol. XXIII, No. 18.

MR. PERKINS' BUSINESS LIFE

Director of Steel Corporation Nearly 19 Years—His Views on Profit Sharing

The death of George W. Perkins on June 18, although it followed a long illness from heart disease, rendered acute as a consequence of an attack of influenza and pneumonia while he was serving in France as an officer of the Young Men's Christian Association, came as a distinct shock to his business friends. Judge Gary, who had so long been associated with Mr. Perkins on the board of directors of the Steel Corporation, was so deeply affected that he said he could not make a statement. James A. Farrell, president of the corporation, said:

"I am grieved to learn of the death of Mr. Perkins. He was a man of high ideals, constructive ability and integrity of purpose, possessed of clear vision and those human and kindly qualities which endeared him to his associates in the corporation. His love for his country and unfailing patriotism were constantly in evidence, and those of us who were associated with him had for him the highest respect and esteem."

Mr. Perkins was elected a member of the board of the Steel Corporation and chairman of the finance committee in November, 1901, and continued a director until his death. He was succeeded by Judge Gary as chairman of the finance committee Feb. 26, 1907. Mr. Perkins was a regular attendant at the meetings of the board, and took a deep interest in the affairs of the corporation, especially in its welfare work. He was a member of the American Iron and Steel Institute and frequently attended its meetings. His last appearance as a speaker at a dinner of the institute was at the May meeting in 1918, shortly after his return from Europe. In his address at that time he said that the countries of the Old World had been amazed by the achievements of the steel industry of the United States, and especially by the lack of friction between labor and capital. He told of meeting 36 members of the Cleveland Chamber of Commerce in Paris, who had gone from Ohio to France to pave the way for business. He said to them that it would have been better for them to have gone to Washington instead of to Paris, for what business needs above all other things is assurance that it will be able to co-operate and not be compelled to subject itself to the competitive methods of the past. Mr. Perkins said there is an amazing lack of information in this country in regard to methods of business, and he thought that no opportunity should be lost to inform the country, and especially the members of Congress and others in authority, upon business topics. He believed that it is the duty of the American Iron and Steel Institute to undertake the education of the people of the country in favor of co-operation and on all great economical questions.

Views on Profit Sharing

In an address before the National Civic Federation, in September, 1919, he explained in some detail his partnership in industry plan. Outlining what he regarded as a practical, workable profit-sharing system, Mr. Perkins said:

"A good many years of actual experience have made me optimistic regarding profit-sharing plans worked out along the following lines:

"First—Every business has, first of all, to earn operating expenses, depreciation and fair returns on honest capitalization.

"Second—I believe that every business should consider that the compensation paid employees is for the purpose of earning a sum of money sufficient to pay the above-mentioned items.

"Third—That any profits over and above such sum should, on some percentage basis, be divided between the capital used in the business and the employees engaged in the business.

"Fourth—That in neither case should these profits be immediately withdrawn from the business; that they should be left in the business for a reasonable length of time, to protect and increase its financial strength and safety; that in the case of capital its share of these profits should be carried to surplus; that in the case of employees their share should be distributed to them in some form of security representing an interest in the business, and that each employee should be required to hold such security for a reasonable length of time, say, three to five years.

"Fifth—That the employees' share should be alloted to them as nearly as possible on the basis of the compensation they receive. Up to date this has proved to be the best method."

Where profit-sharing plans have divided profits on a cash basis, failure often has been the result, Mr. Perkins pointed out, because the objective of the scheme, to get workmen interested not only in their own rewards but in business efficiency, had been ignored. Accordingly, he advocated publicity with regard to the details of the business or industry which would acquaint the employee with the exact financial situation and show him the way to aid in improving it by his personal efforts, with the resultant reward as his incentive. To cement this interest he urged that employees become security holders, financially interested in their concerns.

To the objection that owners would hesitate to let it be known publicly how little or how much they earned, Mr. Perkins offered the answer that a business "merely getting by" would be improved were its true condition known so that its working organization might better it, whereas a business reaping huge profits could not expect to enjoy that privilege secretly for long.

"The day of secretive methods is passing rapidly," said Mr. Perkins. "The day of publicity is at hand. Any profit-sharing plan without an open, honest balance sheet and detailed annual report will never succeed. I am convinced that labor is entirely willing that capital should have its fair reward and proper protection, but in this country we have too many instances where capital has demanded improper protection and taken exorbitant reward; and one of the main reasons why the serious problems confronting us to-day are so difficult of solution lies in the fact that too many men of capital are still arrogant and unreasonable.

"On the other hand, one of the most serious drawbacks to increased output and economical production is the listless, indifferent service rendered by a large percentage of employees. Making partners of employees through profit sharing would correct this as nothing else could."

Strike on the New Haven

BOSTON, June 22.—New York, New Haven & Hartford Railroad yardmen employed in New Haven, Conn., in the Cedarhill yards, went on strike June 21, whereupon an embargo on all outgoing freight from that city has been declared. No strikes on other parts of the New Haven system or on the Boston & Maine and Boston & Albany roads are reported, and none expected. It is believed the New Haven trouble will be short lived. Before the present trouble started the Delaware & Hudson Railroad placed an embargo on all shipments to Boston & Maine and Boston & Albany points.

An increasing number of industrial films of manufacturing plants are being made which are being exhibited from automobile trucks of the Bureau of Commercial Economics, Washngton, and in chambers of commerce and technical schools throughout the country. One of the plants recently filmed in six reels by the Universal Film Mfg. Co., New York, was that of the National Acme Co., Cleveland, described in THE IRON AGE June 17.

The Engineering Index for 1919, published by the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York, is now available. It contains some 12,000 references to nearly 700 engineering and allied technical publications. As in the forerunning volumes, an extended and cross-indexed alphabetical key provides for ascertaining what has been printed on a given subject. The established practice has also been followed of giving the reader a brief statement in most cases of the scope of the article.

Machinery Markets and News of the Works

BUYING DEFERRED

Additions and New Buildings Delayed by Contractors

Three Railroads Have Completed Purchases—American Railway Association Conventions Were Sales Factors

The tendency either to cancel orders or to defer purchases until some future time is causing the volume of present sales to continue at a low level. The chief cancellations come from automobile makers, who attribute their action to inability to get steel and to a falling off in demand for pleasure cars. The indefiniteness of deliveries obtainable is also a contributive cause. The deferment of purchases has two causes: The expectancy that prices will fall and the inability of manufacturers who contemplate additions or new buildings, to get construction work contracted for. Two more raises in price are announced.

Many representatives of the purchasing staffs of railroads were at the conventions of the American Railway Association at Atlantic City, where tools were on display and some immediate purchasing is expected from their inspection of these tools. The Atlantic Coast Line has closed on about $500,000 worth of machines. Both the Chicago, Burlington & Quincy and the Chicago, Milwaukee & St. Paul have finished their purchasing.

From New York recent sales were made of 30 car wheel lathes for export, chiefly for France, and 20 milling machines for the Bridgeport plant of the General Electric Co. The Amoskeag Mfg. Co., Boston and Manchester, N. H., cotton goods, has decided on tools against a long list issued, but awaits official sanction before the purchase. The National Tube Co. is asking, through its Pittsburgh office, for a round lot of machines for its plant at Lorain, Ohio. The Mansfield Sheet & Tube Co., Mansfield, Ohio, has bought several machines.

In the Chicago district, deliveries of machines are better because of a slight improvement in transportation.

New York

NEW YORK, June 21.

Cancellations of orders for tools by the automobile makers continue, attributed to their inability to secure steel and to a falling off in the demand for pleasure cars. One New York representative of tool builders, much patronized by automobile interests, reports cancellations amounting to $60,000 the last week on his one line of tools alone, four automobile companies being involved. A large New York machine-tool house has secured the bulk of the orders, amounting to $500,000, for the Atlantic Coast Line, whose inquiries came from Wilmington, N. C. The same company recently sold for export, principally to France, but also to Belgium and Great Britain, about 30 carwheel lathes. A New York salesman of milling machines has disposed of 20 against the inquiry of the General Electric Co. for its Bridgeport, Conn., plant.

It is reported that the Baldwin Locomotive Works, which inquired for about 15 cranes, will soon issue a list of tools for a war plant which it has acquired, and which it will convert into a locomotive repair shop. It is said that the Norfolk & Western, after it has closed on its pending list of heavy tools, will issue another list of lighter tools. The Chicago, Burlington & Quincy has closed on a list, the turret lathes alone costing $30,000. The New York Central is inquiring for a group of tools, some of which have been bought for the shops in Harmon. It is expected that the Erie must close before long on its list of about 50 tools, which has been pending for a long time, because of the extreme need of this road for new equipment. The Pierce Arrow Co., Buffalo, recently bought eight machines.

The E. W. Bliss Co., Brooklyn, has been converting its plant, used for making shells, into peace-time lines, and has been buying, one recent purchase including three horizontal boring mills.

The New York office of a Cleveland maker of turret lathes has been informed of a price advance on small tools used as accessories to this make, effective June 22. A maker of electric controlling instruments announces the first advance in two years. Several machines were sold from the floor at the convention of the American Railway Association in Atlantic City week before last, most of these sales being for replacements. There is a scarcity of heavy second-hand machines.

Buyers of cranes still are inclined to refrain from placing orders as long as possible. A large government inquiry comes from the Chief of Transportation Service, Water Transportation Division, Munitions Building, Washington, closing June 24, which includes 5 steam-driven gantry cranes and 19 locomotive cranes of from 10-tons to 50-tons capacity. The Westchester Lighting Co. inquiry for a 10-ton locomotive crane has been withdrawn. An inquiry for hand-power cranes may develop shortly from the West India Sugar Finance Corporation, 129 Front Street, New York. The Baldwin Locomotive Works has purchased five 70-ton overhead cranes from the Morgan Engineering Co. and eight 20-ton and 30-ton overhead cranes from the Niles-Bement-Pond Co. The American Brake Shoe & Foundry Co., New York, is asking prices for estimating purposes on a 10-ton overhead traveling crane for Newark, N. J. Numerous export inquiries for hand-power cranes and hoists are being received.

Among recent sales are: The Shepard Electric Crane & Hoist Co., twelve 15-ton electric hoists to the Cuban Cane Sugar Corporation, Havana, Cuba, and five 3-ton jib cranes to the Newport News Shipbuilding Co., Newport News, Va.; the Browning Co., a 20-ton, 50-ft. boom locomotive crane to the American Creosoting Co., Newark, N. J.; the Morgan Engineering Co. a 3-ton bucket crane to the Atlantic Refining Co., Philadelphia; Roeper Crane & Hoist Works a 20-ton hand-power crane to Melchior, Armstrong & Dessau, New York, for export to Cuba; Niles-Bement-Pond Co., one 5-ton and one 10-ton overhead traveling crane to the New York Municipal Railways, Brooklyn, N. Y.

The Hodgman Rubber Co., 8 West Fortieth Street, New York, manufacturer of automobile tires, has arranged for the erection of a power plant in connection with its new five-story factory on Scarsdale Avenue, Tuckahoe, N. Y. The rubber works will cost about $200,000.

The Bensine Condensation Co., New York, has been incorporated with a capital of $100,000 by L. Maucher, D. S. Ives and A. S. Hall, 150 Nassau Street, to manufacture condensation apparatus for machine shop service and other mechanical equipment.

The Janusch Mfg. Co., 496 East 134th Street, New York, manufacturer of brass goods, has awarded contract to the Gabler Construction Co., 402 Hudson Street, for extensions and improvements in its plant on 135th Street.

The Boedicker Photo-Litho Machine Corporation, New York, has been incorporated with a capital of $1,000,000 by T. H. Dimon, H. T. Thomas and J. Loughrey, 507 Fifth Avenue, to manufacture special machinery and parts.

The Massey Machine Co., Pearl Street, Watertown, N. Y., manufacturer of engine governors, etc., has increased its capital stock from $100,000 to $200,000.

The Brooklyn Union Gas Co., 176 Remsen Street, Brooklyn, will build a one-story steel generator works on Twelfth Street, near Second Avenue, to cost about $50,000. A new one-story pumping plant will be erected, also, to cost about $40,000.

The Bermac Products Corporation, New York, has been incorporated with a capital of $500,000 by F. M. Berkley, E. G. McKinley and B. H. Clegg, 156 Willoughby Avenue, Brooklyn, to manufacture airplanes and parts, automobile parts, etc.

The Barr Radiator & Mfg. Co., Brooklyn, has been incorporated with an active capital stock of $26,000 by J. F. Meehan, W. J. Eager and S. D. Barr, 111 Underhill Avenue, to manufacture automobile radiators and other sheet metal products.

The Kenmore Machine Mfg. Co., 298 Nevins Street, Brooklyn, has filed notice of dissolution under its New York charter.

The Comarete Steel Co., New York, a Delaware corporation, has increased its capital from $800,000 to $2,800,000.

The Kamco Corporation, New York, has been incorporated with a capital stock of $150,000 by N. Flora, L. Jarosh and G. T. Buckley, 117 West Fifteenth Street, to manufacture adding machines and parts, special tools, etc.

The McMillan Motors Corporation, Yonkers, N. Y., has been incorporated with a capital stock of $150,000 by D. P. Smelzer, D. J. Burns and A. G. McMillan, 416 Broome Street, to manufacture automobile parts, motor equipment and apparatus.

McKaig-Hatch, Inc., 1590 Niagara Street, Albany, N. Y., manufacturer of machine products, has had plans prepared for a new plant to comprise three one-story buildings, including a hammer shop, 60 x 150 ft., general plant, 50 x 200 ft., and office, 50 x 50 ft. G. Morton Wolfe, 1377 Main Street, is architect and engineer. Archibald McKaig is president.

Druignid Brothers, Brooklyn, operating a machine shop at 975-83 Atlantic Avenue, have filed plans for a one-story addition to cost about $25,000.

H. P. Arndt, Inc., New York, has been incorporated with a capital stock of $150,000 by G. J. Frick, G. B. Kelley and H. P. Arndt, 240 West Twenty-third Street, to manufacture engineering apparatus and mechanical equipment.

The Granville Tire Co., 103 Park Avenue, New York, manufacturer of automobile tires, has increased its capital stock from $10,100,000 to $15,000,000.

The United States Industrial Alcohol Co., 27 William Street, New York, has acquired land at the corner of Grand Street and Garrison Avenue, Maspeth, L. I., aggregating about 200,000 sq. ft., for the erection of a new plant, estimated to cost, with machinery, close to $1,000,000.

The Harper Machinery Co., 15 Park Row, New York, has filed notice of dissolution.

The Schacht-Arthur Motor Truck Co., New York, has been incorporated with a capital stock of $50,000 to operate a plant for motor truck rebuilding, manufacture of parts, etc. W. Schacht, F. H. Reuman and B. D. Arthur, Hotel Wellington, New York, are the incorporators.

The Hunter Illuminated Car Sign Co., Linden Avenue, Flushing, L. I., manufacturer of metal car signs, etc., has filed plans for a one-story brick addition, 40 x 85 ft.

Fire, June 17, destroyed the power plant of the Santiago Electric Light, Railway & Power Co., Santiago, Cuba, with loss reported at about $1,000,000, including electric machinery and considerable rolling stock.

The Eclipse Cord Tire Corporation, White Plains, N. Y., has been incorporated with a capital stock of $1,000,000 by L. E. T. Connett, White Plains; William J. Cullen and C. M. McKeever, Brooklyn, to manufacture automobile tires.

Von Thaden & Meyer, Inc., 73 Murray Street, New York, manufacturer of hardware products, has increased its capital stock from $75,000 to $150,000.

The Doyle Pneumatic Appliance Co., Mayville, N. Y., has been incorporated with a capital stock of $250,000 by J. B. Weiss, E. L. Kissel and A. J. Maginnis, Mayville, to manufacture pneumatic equipment.

The Acme Road Machinery Co., East Main Street, Frankfort, N. Y., manufacturer of road-building machinery, has increased its capital stock from $120,000 to $200,000.

William Motors, Inc., New Rochelle, N. Y., has been incorporated in Delaware with a capital stock of $5,000,000 to manufacture three-wheel vehicles, parts, etc. The incorporators are Harry S. Houpt, New Rochelle; Arthur S. Alexander and Paul N. Turner, New York.

The Mercantile Welding & Salvage Corporation, West New Brighton, S. I., has been incorporated with a capital stock of $125,000 to manufacture and repair boilers. G. E. Hubbs, E. McMahon and W. D. Bush, 7 Allen Court, West New Brighton, are the incorporators.

The Calumet & Hecla Mining Co., 12 Broadway, N. Y., is planning for the installation of extensive equipment at its properties at Calumet and Lake Linden, Mich., to cost about $2,000,000. The work will include a sand handling plant, with loading and conveying machinery.

Officials of George W. Goethals & Co., Inc., 40 Wall Street, New York, have organized a subsidiary organization to be known as Goethals, Wells & Co., designed to operate in engineering and mechanical work not handled by the parent organization. George W. Goethals is president and George M. Wells, vice-president.

The Vulcan Detinning Co., Sewaren, N. J., has increased its capital stock from $3,500,000 to $5,646,000.

The Whitall Tatum Co., 46 Barclay Street, New York, manufacturer of rubber specialties, has awarded contract to the H. H. Vought Co., 70 East Forty-fifth Street, for a three-story, steel and concrete addition to its plant at Keyport, N. J., 50 x 200 ft., to cost about $200,000, including equipment.

The Circle Washer Co., Belleville, N. J., manufacturer of mechanical appliances, has had plans prepared for a new plant, 100 x 100 ft., one story, at Academy and Stephen streets, to cost about $25,000. William E. Lehman, 738 Broad Street, Newark, is architect.

The Seaboard Refractories Co., Valentine, near Fords, N. J., has been organized to manufacture high-grade refractories. The officials of the company are those formerly interested in the Didier-March Co., Keasbey, N. J., manufacturer of tunnel kilns, etc., including George A. Balz, Millard E. Gray and Carl Von Hartz. The Didier-March plant was recently acquired by the Carborundum Co., Niagara Falls, N. J., and arrangements have been made for early operation.

In addition to the proposed new electric power plant to be erected by the Bureau of Yards and Docks, Washington, D. C., at Lakehurst, N. Y., at a cost of about $400,000, plans have been prepared for new shops for ordnance service to cost $282,000, including equipment. Bids for construction will be asked at once.

The Bournonville Rotary Valve Motor Co., Jersey City, N. J., has been incorporated with 3000 shares of stock of no specified par value, to manufacture special engines for automobile use, parts, etc. Eugene M. Bournonville, R. I. Tuthill and E. J. St. Clair, Jersey City, are the incorporators.

The Industrial Machinery Co., 435 Summit Avenue, Jersey City, N. J., has filed notice of organization to manufacture machinery and parts. Otto and Albert Herman, 18 Journal Square, head the company.

The Atlas Foundry Co., Lyons Avenue and Coit Street, Irvington, N. J., has had plans prepared for a one-story addition, 50 x 75 ft.

The Central Cornice & Skylight Works, 909 Springfield Avenue, Irvington, N. J., has filed notice of organization to manufacture sheet metal products. John Brisco, 67 Ball Street, heads the company.

The Art Metal Works, 7 Mulberry Street, Newark, N. J., has acquired the Birkenhauer & Bauman Brewery property at Morris and South Orange avenues, about 122 x 153 ft. The existing structure will be remodeled and equipped as a branch plant for the production of metal specialties, similar to the line manufactured at the main works. Louis Aronson is president.

The Newark Automobile Body Builders, 105 Broome Street, Newark, N. J., has filed notice of organization to manufacture automobile bus and truck bodies, parts, etc. Harry Reid, 48 Barclay Street, heads the company.

The Humphrey Die & Tool Corporation, Salem, N. Y., will increase its capital stock from $6,000 to $50,000 and has purchased two and a half acres with a highway frontage of 385 ft., a Delaware & Hudson frontage of 300 ft., the property including a factory building and two-story shop, 28 x 85 ft. It will build additions and will be in the market soon for shapers, milling machines, surface grinders and tool room lathes. The company specializes in the designing and manufacture of dies. A. H. Humphrey, manager, has had 30 years' experience in this line and has been connected with the Western Electric Co., Westinghouse Electric & Mfg. Co., General Fireproofing Co. and S. Sternau & Co., Brooklyn.

George Z. Premont, formerly superintendent, Kraeuter & Co., Inc., Newark, N. J., pliers, and Harry D. Neff, E. W. Myers and Herbert Demarest, formerly representatives of that corporation in New England and elsewhere, have organized the Forged Steel Products Co. under New Jersey laws. A plant has been secured at 141-143 Frelinghuysen Avenue, Newark, and the production of slip-joint automobile pliers will begin about July 15.

The Meisselbach-Catucci Mfg. Co., automatic gear hobbing machines, Newark, N. J., has purchased the shop of the Union Wheel Works, 51 Stanton Street, in the Frelinghuysen Avenue factory development. The company is converting the building to meet its requirements.

Philadelphia

PHILADELPHIA, June 21.

The Taylor-Wharton Iron & Steel Co., Widener Building, Philadelphia, is taking bids for an addition to its machine shop, at Twenty-fifth and Washington streets.

The Hurley Motor Co., Broad and Race streets, Philadelphia, has acquired property in the vicinity of its present building for a consideration said to total about $500,000 and plans have been completed for a 15-story building, 58 x 130 ft., to cost about $750,000. Possession of the

property will be taken on July 5, and construction inaugurated immediately.

The Walter Snyder Co., 3431 Market Street, Philadelphia, manufacturer of laundry machinery, has filed plans for a one-story addition to its machine shop.

The John E. Thropp's Sons Co., Lewis Street, Trenton, N. J., manufacturer of rubber mill machinery, mechanical stokers, etc., has completed plans for a one-story brick foundry to cost about $40,000.

The Harbor Commission, Camden, N. J., will call for bids at once for the construction of the proposed marine terminal at the foot of Spruce Street. Considerable mechanical equipment will be installed, including loading and unloading machinery, conveying apparatus, etc. The pier will be 102 x 485 ft., and the terminal proper, 86 x 485 ft. It is estimated to cost close to $400,000.

The Ajax Rubber Co., Philadelphia, manufacturer of automobile tires with plant at Trenton, N. J., has removed its local branch from 316 North Broad Street to 846 North Broad Street for increased facilities.

Froelich Brothers, Inc., 142 North Seventh Street, Philadelphia, plumbers' supplies, has had plans prepared for a new pipe building at Tenth and Hutchinson streets, to cost about $10,000.

The Bureau of Yards and Docks, Washington, D. C., is taking bids for the erection of a new building at the League Island Navy Yard, Philadelphia, to cost about $100,000. The Ordnance Department has also completed plans for a new experimental station at the Frankford Arsenal.

Bids are being asked for the erection of a one-story, brick and concrete power house at the plant of the Bloch Go-Cart Co., 1134-36 North American Street, Philadelphia.

Fire, June 16, destroyed a large portion of the plant including machinery, of the Hulburt Oil & Grease Co., Sepviva Street and Erie Avenue, Philadelphia, with loss estimated at $200,000.

The Commercial Truck Co. of America, Twenty-seventh and Brown streets, Philadelphia, has filed plans for a one-story forge shop at Rising Sun and Hunting Park avenues, to cost about $15,000. Contract has been let to William Steele & Son, 1600 Arch Street, for the proposed new truck manufacturing plant at this location, to cost about $150,000.

The Allentown Cable & Machine Co., Allentown, Pa., is taking bids for a one-story plant at Hamilton and John streets, 50 x 100 ft., to cost about $35,000. H. Anderson, Stiles Building, is architect.

The Keystone Aluminum Co., Kittanning, Pa., has been incorporated in Delaware with a capital stock of $260,000 by Corbin Wyant, M. E. Hawk and Hyatt L. Hawk, all of Kittanning, to manufacture cooking utensils.

The Frick Co., West Main Street, Waynesboro, Pa., has completed plans for a one-story foundry, 150 x 300 ft., and two-story pattern shop, 30 x 100 ft., to cost about $300,000, including equipment.

Frank A. Moorshead and associates, Lansdowne, Pa., have organized the Chambersburg Foundry Co., with capital stock of $50,000, to manufacture iron and steel castings, etc., and the Metal Wringer Co., capitalized at $10,000, to manufacture clothes wringers and other specialties.

Fire, June 10, partially destroyed the rod mill at the plant of the John A. Roebling's Sons Co., South Broad and Canal streets, Trenton, N. J., manufacturer of wire rope, cable, etc., with loss estimated at $25,000. It will be rebuilt immediately.

Clarence A. Watkins, 1125 Spruce Street, Philadelphia, and associates have organized the Standard Steel Equipment Co., with capital stock of $50,000 to manufacture steel and iron specialties.

The Hunter Motor Car Co., 27 South Second Street, Harrisburg, Pa., recently organized to manufacture automobiles, is having plans prepared by C. H. Kain, 317 Chestnut Street, for the initial units erected on a local site. The plant with equipment will cost about $250,000. C. H. Hunter is president, and Simon E. Miller, treasurer.

The Boyer Electric Co., Bethlehem, Pa., has been incorporated in Delaware with capital of $15,000 by Harry Boyer, James E. Mathews and Elliott N. Wilson to manufacture electrical products.

Fire, June 17, originating in the boiler department at the plant of the Eagle Wheel & Bending Works, Lancaster, Pa., destroyed a portion of the factory with loss estimated at $25,000. The plant is operated under the name of the Lebzelter Mill.

The Susquehanna Collieries Co., Wilkes-Barre, Pa., has arranged for extensive work at its Richards and Pennsylvania collieries, including the construction of a new breaker with a daily capacity of about 3000 tons, and electric power plant of about 9000 kw.

New England

BOSTON, June 21.

Machine tool sales in this district the first 15 days of the month showed a pronounced falling off compared with corresponding periods in the first five months of 1920. The past week the market has been even quieter. The aggregate sales, however, for the five and a half months ending June 15 are far in excess of those for the corresponding period last year. Prices hold firm. Deliveries have not improved, the best that can be done on some machines being next January, February or March. No cancellations of importance are reported, but deferred purchases are growing more plentiful. For instance, the Cone Automatic Machine Co., Inc., Windsor, Vt., has signified its intention of discontinuing purchases until Sept. 1 at least, in expectation of lower prices; the Asbestos Wood Co., Nashua, N. H., has postponed construction of additions and has decided not to buy machine shop equipment; B. F. Perkins & Sons, Holyoke, Mass., paper mill machinery, who had a large list out for machine tools for a proposed shop, have postponed building because no contractor will handle the proposition except on a cost plus basis. These are a few of many similar cases.

Business the past week has been confined almost exclusively to single tools. The R. H. Long Body Co., Framingham, Mass., automobile bodies, has purchased a drill, lathe and grinder; La Pointe Machine Tool Co., Hudson, Mass., a large miller; Osgood Bradley Co., Worcester, Mass., a grinder; Jones & Lamson Machine Co., Springfield, Vt., a tool room lathe; Old Colony Tool Co., Taunton, Mass., a 16 in. x 6 ft. lathe, and the Frank O. Wells Co., Inc., Greenfield, Mass., a grinder.

The Portsmouth Navy Yard is interested in a few bench tools, a Maine paper mill is in the market for a lathe, the Old Colony Tool Co., Taunton, Mass., has not covered its tool room equipment requirements, the Power Construction Co., Worcester, Mass., wants a 4-in. or 6-in. pipe machine, immediate delivery, and the Taft, Pierce Mfg. Co., Woonsocket, R. I., is still interested in equipment for automobile parts production, fairly prompt deliveries. The Amoskeag Mfg. Co., Boston and Manchester, N. H., cotton goods, has practically decided on the tools it will buy against its list, but is waiting for the return of one of the leading officers before placing orders. The Saco-Lowell Shops, Boston, cotton mill machinery, have not covered their Biddeford, Me., and Lowell, Mass., requirements, but are buying very little equipment at the moment. The General Electric Co., West Lynn, and the United Shoe Machinery Co., Beverly, Mass., have been out of the market the past week. New England steam and street railroads show no interest in machine tools.

One street railroad company is in the market for a 12-ton crane. The Amoskeag Mfg. Co. has not closed on its crane requirements, and the Palmer Foundry, Palmer, Mass., decided not to buy the 5-ton crane under consideration and therefore is not in the market. The Windsor Foundry Corporation, Windsor, Vt., has postponed the erection of its contemplated foundry and has dropped crane negotiations.

Machine screw products continue in active demand, in short supply and strong in price. The local market on cap and set screws is mixed. Some houses quote set screws at 10 off list and others at 25 per cent discount, some quote cap screws at list and others at 20 per cent discount. New England cap screw manufacturers' lists are higher than those of concerns elsewhere. The net earnings of one New England producer last month amounted to $3,700, or at the rate of practically 2¼ per cent on the capital invested for the year. This poor showing is due to the fact that the company, unable to secure raw materials from mills, has been obliged to go into the open market and pay premiums for stock to fill contract orders.

The Vermont Farm Machinery Co., Bellows Falls, Vt., cream separators, etc., has been placed in the hands of receivers.

The Union Bag & Paper Co., New York, has awarded a contract for a two-story, 82 x 322 ft. machine room for its Augusta, Me., plant.

Contractors are figuring on a new reinforced concrete five-story, 75 x 400 ft. mill at Pittsfield, Mass., for the General Electric Co.

Sketches have been made for the J. A. & W. Jolly Co., Holyoke, Mass., hand power elevators, etc., which contemplates the erection of a one-story foundry.

Work has started on the alterations and additions to the Morris Metal Products Co., Union Avenue, Bridgeport, Conn. No new equipment will be needed.

A contract for the erection of the new Pratt & Whitney

Mfg. Co., Hartford, Conn., one-story tool building will soon be let.

Work has started on a one-story addition to the Hudson, Mass., plant recently acquired by the General Electric Co., West Lynn, Mass. It has sufficient land to provide for further expansion as necessary.

The Brown & Sharpe Mfg. Co., Providence, R. I., machinery and tools, expects to have its new foundry in operation next month or early in August. With new equipment its daily cupola output will total more than 100 tons.

The A. F. Way Co., Hartford, Conn., special machinery and tools, has acquired property at Burnside, Conn., on which it will erect a one-story, 60 x 129 ft. concrete and steel machine shop and manufacturing plant. Operations are expected to begin next fall.

After considerable delay, owing to the scarcity of materials and the transportation situation, work has begun on the new plant units for the Gilbert & Barker Mfg. Co., Springfield, Mass., consisting of a three-story, 63 x 222 ft. recreation building; 164 x 181 ft. sheet metal building addition; two-story, 80 x 400 ft., foundry; two-story garage; one-story testing building; boiler and engine room; hydro-oxygen building, and a one-story, 43 x 50 ft., sand blast building.

The Greyhound Motors Corporation, a $500,000 Delaware corporation with headquarters in New York, has broken ground for a one-story, 100 x 200 ft. plant at East Warren, R. I. It intends for the present to produce a light roadster, with a body built by the Trinca or one or two-piece sheet metal method, and next year anticipates the construction of another type of car and additional plant units. The company owns 15½ acres having 1400 ft. frontage on the New York, New Haven & Hartford Railroad electric line between Providence, R. I., and Fall River, Mass. John C. Temple, formerly vice-president Duro-Flake Graphite Co., is president; Charles K. Weakland, purchasing agent National Cloak & Suit Co., New York, vice-president; John J. Riley, auditor J. Edward Ogden Co., New York, secretary and treasurer. A. C. Velo, formerly with the engineering department Fiat Automobile Co., Turin, Italy, also with Curtiss Aeroplane Co., and during the war with the Gnome Engine Works, is director and chief engineer, and Frederick K. Trinca, inventor, is director and superintendent.

The Yale Tire & Rubber Co., Hamden, Conn., manufacturer of tires, has increased its capital stock from $500,000 to $1,500,000.

The Waterbury Clock Co., Cherry Street, Waterbury, Conn., will build a one-story power house, 50 x 57 ft., to cost about $12,000.

Plans have been prepared by the Fairhaven Mills, New Bedford, Mass., for a two-story addition to its machine shop, 80 ft. long; the present machine shop is one-story, and this will be extended another floor, making a complete two-story structure. Extensions will also be made to the forge shop, as well as other additions to the main plant. The work is estimated to cost about $150,000.

The National Welding Co., 17 Charles Street, New Haven, Conn., has filed notice of organization to manufacture welding equipment. J. F. Shuford heads the company.

Extensions and improvements to cost about $500,000, including machinery, will be made at the plant of the Thames River Specialties Co., Montville, near Norwich, Conn., manufacturer of paper goods. The work will include a new one-story power plant, 45 x 50 ft., with new equipment, and a two-story manufacturing plant, 250 x 400 ft. This company was recently acquired by the Robert Gair Co., 50 Washington Street, Brooklyn, and will be known as the Thames River Division of the Robert Gair Co.

The Berkshire Steel Products Co., Bridgeport, Conn., has had plans prepared for a two-story building, 54 x 140 ft., on Railroad Avenue, to cost about $50,000.

The United States Rubber Co., New Haven, Conn., has arranged for the remodeling of two buildings on Chapel Street and Walnut Street, respectively, for extensions. The work will cost about $15,000.

The Snow & Petrelli Mfg. Co., New Haven, Conn., manufacturer of small cannon, nail pullers and similar products, has increased its capital stock from $35,000 to $200,000.

The Union Mfg. Co., New Britain, Conn., manufacturer of iron castings, lathe and planer chucks, etc., has increased its capital stock from $500,000 to $1,000,000. H. H. Wheeler is secretary.

The Metal Specialty Co., Waterbury, Conn., manufacturer of brass goods, has increased its capital stock from $100,000 to $200,000.

Bids are being received by F. F. Jonsbery, Boston, architect, for a one-story Ford service station and machine shop at Falmouth, Mass.

Buffalo

BUFFALO, June 21.

The Gray Machine Tool Co., 620 Fidelity Building, Buffalo, has arranged for a change of name to the Gray Machine & Parts Corporation. It recently increased its capital stock to $300,000, and has commenced preliminary operations for the establishment of its new plant at Batavia, N. Y., for the manufacture of milling machines and other machinery. A portion of the works of the Batavia Steel Products Co., has been acquired. Alexander Gray is president, and Alexander M. D. Martin, secretary.

The Aluminum Ware Mfg. Co., 30 Church Street, New York, manufacturer of aluminum toys and kindred specialties, has awarded contract to the Bowman Construction Co., Elmira, N. Y., for a one-story addition at 557 East Clinton Street, Elmira, 136 x 300 ft.

The Catalano-Cocca Safety Gas Fixture Corporation, North Collins, N. Y., has increased its capital stock from $50,000 to $250,000.

The Ogdensburg Machine Co., Ogdensburg, N. Y., has completed plans for a one-story machine shop on Catherine Street, to cost about $20,000.

The Jones Oil Engine Co., Walton Street, Syracuse, N. Y., has had plans prepared for a new one-story building on North Fifth Street, 50 x 100 ft., to cost $10,000.

The Curtiss Aeroplane & Motor Corporation, foot of Churchill Street, Buffalo, is arranging for the discontinuance of production of commercial aeroplanes, due to foreign competition and lack of proper legislation to protect the domestic market. It is proposed to utilize the plant for the manufacture of other products and the change will be made within the next few weeks. The company will continue the operation of its Garden City, L. I., plant, primarily for the production of parts and replacement equipment for machines now manufactured. This works will also be used as a distributing point. At the termination of the war, the company had seven plants in operation; the largest of these, on Elmwood Avenue, Buffalo, was sold to the Government; leases on three other Buffalo plants formerly used have been given up, while the plant at Hammondsport, N. Y., has been sold and that at Marblehead, Mass., known as the Burgess works, has been closed. C. M. Keyes is vice-president.

The International Olympian Railway System Safety Appliance Co., Jamestown, N. Y., has been incorporated in Delaware with a capital stock of $500,000 to manufacture railroad safety equipment. James P. Seartsaris and George N. Andriadakis, both of Jamestown, are the incorporators.

The W. Robertson Machine & Foundry Co., 58 Rano Street, Buffalo, has completed plans for a one-story addition, 120 x 170 ft., to be used as an assembling shop. It will cost about $15,000.

The Eastman Kodak Co., Rochester, N. Y., has acquired a portion of the Government plant erected at Kingsport, Tenn., for the establishment of branch works. It represented an investment of about $1,000,000 by the Government, and the purchase price has not been stated. It is proposed to equip the buildings at once and the machinery installation is estimated to cost about $250,000.

The R. & S. Machine Co., Lockport, N. Y., has been incorporated with a capital stock of $25,000 by G. A. Sheriff, F. B. Rhodes and W. A. Condon to manufactuer machinery and parts.

The Ericsson Mfg. Co., 1100 Military Road, Buffalo, manufacturer of ignition equipment, is planning for the installation of a number of machine tools.

The Ausable Forks Electric Co., Ausable Forks, N. Y., has made application to the Public Service Commission for permission to build a new electric power plant at Jay, N. Y.

The Birdsall Engine Co., Newark, N. Y., has been merged with the Arcadia Trailer Corporation, a Delaware corporation.

The J. I. Case Threshing Machine Co., Jefferson and West streets, Syracuse, N. Y., has had plans prepared for extensions and improvements. Headquarters of the company are at Racine, Wis.

The Bancroft-Jones Corporation, Mutual Life Building, Buffalo, manufacturer of fabricated steel buildings, has completed plans for a one-story fabricating plant, 80 x 200 ft., at 60 Hubbard Street, to cost about $15,000.

New interests have acquired the plant and business of Williams Brothers, Ithaca, N. Y., manufacturer of well drills, machinery, agricultural implements, etc., headed by Cadwallader Evans, Jr., formerly general manager of the International Salt Co., at its local plant. Roger B. Williams, who has been conducting the business for the past 50 years, has retired. Operations will be maintained as heretofore, and the present company name retained.

Chicago

CHICAGO, June 21.

Sales of machine tools from dealers' stocks have been in fairly good volume the first half of June, but otherwise the machinery market is dull. Most of the trade looks for a rather quiet summer, with the possible exception of some activity in the railroad field. The only noteworthy railroad inquiry now pending is that of the Chicago, Rock Island & Pacific, which was sent out a few weeks ago. Action on this list was deferred by the purchasing department of the road until after the conventions of the American Railway Association. It is expected that orders will be sent out this week. Purchasing by the Chicago, Burlington & Quincy and the Chicago, Milwaukee & St. Paul against their recent lists has been completed.

The machine-tool trade still encounters numerous difficulties in doing business, but conditions are somewhat better with respect to transportation than a month ago. Shipments from Cincinnati are considerably delayed owing to the continuation of the strike there in various machine-tool plants, but from New England tools are being received with more regularity than a few weeks ago. Indiana tool manufacturers have succeeded in getting machines into Chicago by shipping to Michigan City, Ind., and then by boat.

The money situation here is as tight as ever, and this, together with some degree of uncertainty in the minds of buyers as to the future, is holding up practically all plans for industrial expansion. The remarkably small volume of building work in this district also tends to restrict machinery business.

The Cadillac Iron Works, Cadillac, Mich., has been organized by Laughlin Van Meter, C. J. Helm, Dr. A. W. Johnstone and Morton Van Meter, of that city, and will manufacture brick machines for the Helm Brick Machine Co. Work will be begun at once on a new shop 50 x 100 ft., for the Cadillac company.

The Bennington foundry at Dallas City, Iowa, was destroyed by fire with an estimated loss of about $50,000.

The Landian Foundry Co., South Haven, Mich., has purchased land at Hartford, Mich., for a new foundry which will be built at once and be ready for operation by Sept. 1.

The International Harvester Co., Chicago, has purchased the American Seeding Machine Co.'s plant at Richmond, Ind., the entire output of which it has been distributing for eight years.

The Edward Katzinger Co., Chicago, manufacturer of bakers' and confectioners' tools and utensils, has purchased a 15-acre site at Armitage and Cicero avenues, Chicago, on which a new plant will be erected, the first unit to contain 200,000 sq. ft. of floor space. There will be three units, and the entire investment, including land and buildings, will total $2,000,000.

The Tuthill Spring Co., 760 Polk Street, Chicago, manufacturer of automobile springs, will next year build a one-story factory, 200 x 400 ft., to cost $250,000 at Thirty-first and Kilbourn streets.

The Argus Mfg. Co., 402 North Paulina Street, Chicago, metal specialties, will build a new one-story factory, 125 x 169 ft.

The D. O. James Mfg. Co., 1120 West Monroe Street Chicago, manufacturer of cut gears, is having plans prepared for a one-story addition, 48 x 60 ft.

The Interstate Brass Mfg. Co., 11 South Desplaines Street, Chicago, will build a one- and two-story factory, 75 x 125 ft., at 32 North Peoria Street, Chicago.

The Brunswick-Balke-Collender Co., Chicago, has arranged plans for the erection of additions to its automobile tire manufacturing plant at Muskegon, Mich., to cost in excess of $1,000,000. Considerable new machinery will be installed to cost approximately $250,000. The company has increased its capital stock from $12,000,000 to $56,000,000. H. F. Davenport is secretary.

The United States Wire Mat Co., 260 East Wood Street, Decatur, Ill., is having plans prepared for a two-story and basement factory, 60 x 150 ft., to cost about $50,000.

The International Harvester Co., Chicago, is arranging for an increase in its capital stock by an amount of $30,000,000.

C. & R. Mertens, 8112 Robinson Street, Chicago, manufacturer of copper and metal specialties, will build a one-story copper shop, 42 by 125 ft., to cost $18,000.

The Electric Milker Corporation, Winnetka, Ill., has been incorporated in Delaware with a capital stock of $600,000 by Charles F. Harding and Henry F. Tunny, Winnetka; and Harvey A. Perkins, Highland Park, Ill., to manufacture electrically operated milking machinery.

Considerable machinery will be required for the new sugar mill to be erected in the vicinity of Milliken, Colo., by the Great Western Sugar Co., Sugar Building, Denver, Colo. It will have a daily capacity of about 1000 tons, and is estimated to cost close to $2,000,000.

Baltimore

BALTIMORE, June 21.

The Steinmetz Electric Motor Car Corporation, Baltimore, recently incorporated with a capital stock of $2,000,000, has acquired property held by Reus Brothers, operating a machine works on Mount Royal Avenue, Arlington, as a site for its works and plans to inaugurate immediate operations in securing machinery and equipment. It will specialize in the manufacture of electrically operated industrial trucks and delivery cars. Charles P. Steinmetz, Schenectady, N. Y., chief engineer for the General Electric Co., heads the organization.

The Bethlehem Steel Co., Bethlehem, Pa., is arranging for the resumption of car building at its Harlan & Hollingsworth shipbuilding plant at Wilmington, Del. Extensive remodeling is now under way, and it is planned to inaugurate the new line of work at an early date.

The Wizard Check Indorser & Printing Machine Co., Calvert Building, Baltimore, has engaged Parker Thomas Rice, architect, Union Trust Building, to prepare plans for its plant on property recently acquired near the Key Highway and Fort Avenue. The initial buildings are estimated to cost close to $300,000. F. S. Weise is president.

The Commercial Excelite Co., 312 North Eutaw Street, Baltimore, has been incorporated with a capital stock of $40,000 by Louis M. Harry and Irving Rubin, to manufacture electric and gas fixtures and appliances.

The Gillespie-Clough Machine Co., Ashley, Del., has filed notice of change of name to the Robert S. Clough Machine Co.

The National Enameling & Stamping Co., 1901 Light Street, Baltimore, is taking bids for a three-story addition at Race and Ostend streets, 61 x 76 ft.

The Baltimore Tube Co., Ostend and Wicomico streets, Baltimore, Md., manufacturer of metal tubing, has awarded a contract to the West Construction Co., American Building, for a one-story addition to its machine shop, to cost about $25,000.

The Riverside Motor Co., Salisbury, Md., is planning for a one-story machine and repair works, 60 x 100 ft.

The Farmers' Tractor Corporation, Walkersville, Md., has been incorporated with a capital stock of $100,000 by Edwin T. Dickerson, Edward J. Routzahn and George F. Brandenburg, to manufacture motor tractors for agricultural service.

The shell-loading plant of the Marlin-Rockwell Corporation at Port Penn, Del., has been acquired from the Government by J. P. Newell, Chicago, and associates, for a consideration said to be about $125,000. The new owners will raze the various structures and dispose of adjoining land prior to any development for manufacturing.

The McNamara Brothers Co., Westport, Baltimore, manufacturer of boilers, tanks, etc., has revised plans for the proposed shop addition and will soon call for bids. The structure will be one-story, 80 x 200 ft., to cost $25,000.

The Delion Tire & Rubber Co., 131 Mount Royal Avenue, Baltimore, will take bids about July 1 for its new plant, to consist of a main one-story works, 90 x 400 ft., with power plant, and adjoining structure, two-stories, 60 x 70 ft. J. Osborn Hunt, 114 North Montgomery Street, Trenton, N. J., is the architect.

The Standard Motor Co., Raleigh, N. C., is planning for the erection of a one-story and basement assembling works, 82 x 260 ft. With equipment it is estimated to cost about $125,000.

The Harlow-Bolton Machine & Spring Co., Rocky Mount, N. C., has been incorporated with a capital stock of $25,000, by W. L. Hadlow and associates, to manufacture machinery and parts, springs, etc.

The Presto-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene apparatus, has taken bids for its proposed new plant at Baltimore, to consist of eight one-story brick and steel buildings, each about 25 x 50 ft., to cost $75,000.

The Terrell Machine Co., West Fifteenth Street, Charlotte, N. C., manufacturer of textile machinery, is planning for the erection of an addition to its machine shop, 40 x 80 ft.

The Simms Motor Car Corporation, Atlanta, Ga., is having plans prepared by De Ford Smith, architect, Atlanta, for its new plant on a 6-acre tract, lately acquired for the manufacture of a four-cylinder motor car. The company was recently incorporated with a capital of $2,500,000. Thomas H. Marr, formerly general manager of the Edward Valve Co., Chicago, is president.

The Kronenberg X-ray & Supply Co., Inc., 527 North Howard Street, Baltimore, has been incorporated with $50,000 capital stock to manufacture X-rays, electro-medical apparatus, accessories and supplies. The incorporators are Dr. I. Bertram Kronenberg, William J. Casey and George G. Thomas.

The Maryland Automobile Products Co., Hagerstown, Md., has been incorporated with $50,000 capital stock by James J. Doyle, John M. Hammersla and George E. Slaybaugh, to manufacture automobile parts.

The Chesterfield Mfg. Co., Petersburg, Va., will erect a power plant on Swift Creek.

The Milton Mica Co., Richmond, Va., is in the market for oil-burning air compressors, grinding machines, jack hammers, hoists, presses and dies.

Quotations on iron turning lathes with 20-in. swing and 12-ft. bed, will be received by the Blackstone Machine Works, Blackstone, Va.

The Terrell Machine Co., Charlotte, N. C., manufacturer of textile machinery, contemplates additions which will include a 40 x 80 ft. machine shop.

The Hadlow-Bolton Machine & Spring Co., Rocky Mount, N. C., has been incorporated with $25,000 capital stock by W. L. Hadlow and others.

Prices on second-hand steam drills are asked by the J. M. Windham Copper Co., Southern Pines, N. C.

The Cyclone Starter & Truck Co., Greenville, S. C., will build a one-story plant, 100 x 260 ft., to cost about $140,000. The annual capacity will be about 1500 trucks. Lee Houchins is general manager.

Cleveland

CLEVELAND, June 21.

There is little activity in the machine tool market, although some dealers report an improvement in orders and inquiries compared with two or three weeks ago. The National Tube Co., is inquiring through its Pittsburgh office for a round lot of tools for its Lorain, Ohio, plant. The Mansfield Sheet & Tube Co., Mansfield, Ohio, the past week purchased several machines, including a large planer, 6-ft. radial drill and three lathes. The Goodrich Tire & Rubber Co., has deferred buying a round lot of machine shop equipment and an inquiry from the Timken-Detroit Axle Co., for equipment for extensions to its Canton, Ohio, plant is still being held up. Dealers are finding satisfaction in that nearly all the prospective business recently pending and not yet placed, has only been deferred until a later date. Buyers generally are anxious for early deliveries and in most cases the manufacturers who can make the best shipments secure the orders. Work has been resumed on a number of factory buildings in this city after a few weeks suspension because of the lack of material.

The Speed-O-Feeder Co. will establish a plant in Cleveland for the manufacture of a typewriter feeder. The company has a capital stock of $200,000, and its location in this city was secured through the efforts of the Industrial Department of the Cleveland Chamber of Commerce.

The Differential Car Co., New York, has purchased from the Government the plant formerly operated by the Grant Motor Co., Findlay, Ohio, for the manufacture of munitions. The new owner, it is stated, will equip the works for the manufacture of electric dumping cars, dumping bodies for motor trucks, etc.

A new foundry will be built in Columbiana, Ohio, by a company in which Clyde Hoover, William Shaufer and F. H. Grove and others are interested. It will be 100 x 120 ft., and will specialize in castings for rubber machinery.

The Lima Foundry & Machine Co., Lima, Ohio, will shortly begin the erection of a gray iron foundry. It was recently incorporated with a capital stock of $550,000, with A. W. Wheatley, president; Frank Komminsk, vice-president; T. R. Dunlap, treasurer, and A. I. MacDonnell, secretary.

The Vapo-Stove Co., Lima, Ohio, has been incorporated with a capital stock of $500,000, by F. B. Williams, W. D. Welch, W. Meyers and others, and plans to erect a factory for the manufacture of oil burning stoves.

The Perkins Structural Steel Co., Wooster, Ohio, has been incorporated with a capital stock of $200,000 by J. S. Perkins, W. L. Perkins, E. H. Perkins and others, and contemplates acquiring the plant of the Central Construction Co., Wooster, and the Horseheads Construction Co., Horseheads, N. Y. The latter works, which is now under the control of W. L. Perkins, will be moved to Flint, Mich.

R. F. Godfrey has established a brass and aluminum foundry at 716 South Boston Street, Galion, Ohio.

The Long Mfg. Co., will establish a plant in Fremont, Ohio, for the manufacture of automobile radiators.

The Enterprise Aluminum Co., Massillon, Ohio, has increased its capital stock from $50,000 to $500,000.

The Borden Co., Warren, Ohio, plans the erection of a two-story factory and office building, 30 x 124 ft.

Detroit

DETROIT, June 21.

Although the machine-tool and supply business continues dull, a decided renewal of activity is expected within the next 60 days. A slight tendency to cancel orders has been observed, decreasing as the railroad situation eases.

An addition to the factory of the Jefferson Forge Products Co., Jefferson Avenue and Connors Creek, Detroit, will be erected.

The Sunnyhome Electric Co., Detroit, a subsidiary of the General Motors Corporation, is building a temporary factory with 12,000 ft. of floor space, on Scotten Avenue, to manufacture an engine and electric generator for farm lighting and power.

The Michigan Gray Iron Castings Co., Detroit, will erect a one-story, sawtooth, steel and concrete factory on Harbaugh Avenue.

The Northern Iron Works, Detroit, has purchased a site for a new plant and expects to start construction soon.

The Keywell Brothers Iron & Metal Co. has been organized with a capital stock of $75,000 by Samuel K. Keywell, 387 Leland Street, Detroit.

The Ervin Foundry & Mfg. Co., Adrian, Mich., will increase its facilities soon, owing to growth of its business.

The Congress Tool & Die Co., 7 East Fort Street, Detroit, will erect a one-story machine shop, to cost $20,000.

The Wolverine Tube Co., Detroit, will build an addition and has plans in course of preparation.

The Burroughs Adding Machine Co., Detroit, has let contracts for additions to its Canadian plant at Walkerville, Ont.

The Michigan Screw Co., Lansing, Mich., has completed a three-story addition, 60 x 238 ft. It will install 49 automatic screw machines in addition to the present equipment. Six of the machines will be of the large type.

The Fletcher Machine Co., Detroit, will build a new machine shop to cost about $10,000.

The Detroit Graphite Co. is preparing to build a two-story addition to cost $50,000.

The Rich Steel Products Co., Battle Creek, Mich., will establish a branch plant at Los Angeles. The first unit will be one-story, 90 x 400 ft. About 500 men will be employed.

The Aetna Screw Corporation, Jackson, Mich., has been incorporated with a capital stock of $16,000 to manufacture screw products, nails and tools. William G. Jones heads the company.

Officials have authorized an addition to the engine plant of the Oakland Motor Car Co., Pontiac, Mich., a General Motors Corporation subsidiary. The cost will be about $3,000,000 and work will start immediately.

The Bar Steel Parts Corporation, Detroit, has been incorporated with a capital stock of $25,000 by K. A. Morrison, 156 Whitney Avenue.

The Acme Motor Truck Co., Cadillac, Mich., is building an addition, one-story, 64 x 225 ft.

The Handy Governor Corporation, Detroit, has been organized with a capital stock of $25,000 to manufacture motor parts. The company is headed by Robert G. Handy, 412 Edison Avenue.

The Cadillac Iron Works, Cadillac, Mich., has been incorporated to manufacture iron and steel products. The capitalization is $50,000. A. W. Johnstone, Cadillac, heads the company.

The Royal Machine Co., Inc., has been organized by S. Levine, 219 Delmar Avenue, Detroit, and others, with a capital stock of $15,000. It will do a general machine and tool business.

The Recipro Turbine Engine Co., Detroit, has been incorporated at $250,000 by S. G. Bargery, 528 Highland Avenue, Highland Park, Mich., and others to manufacture gasoline engines.

The Star Grinding Wheel Co., 241 Calvary Avenue, Detroit, will soon commence the erection of a one-story and basement addition, 80 x 140 ft.

The Oliver Machinery Co., Coldbrook Street, Grand Rapids, Mich., has completed plans for a one-story brick and steel addition to its foundry, to cost about $50,000.

The Fruehauf Trailer Co., 1375 Gratiot Avenue, Detroit, is planning for the purchase of new machine shop equipment.

The Carde Stamping & Tool Co., Saginaw, Mich., has awarded a contract to James J. Kearns, Saginaw, for a one-story plant, 50 x 200 ft., to cost about $75,000.

The Wood Hydraulic Hoist Co., Russell Street, Detroit, has taken bids for a two-story plant, 140 x 400 ft., on Cardoni Street, estimated to cost about $125,000. It will be equipped for the manufacture of hoisting machinery and truck bodies.

The American Malleable Iron Co., Owosso, Mich., is having plans prepared for a one-story building, 38 x 300 ft., to cost about $50,000.

The National Production Co., Bellevue Street, Detroit, is planning for the installation of new machining equipment for small parts work.

Pittsburgh

PITTSBURGH, June 21.

The Gearless Motor Corporation, Flavel Street, Pittsburgh, is perfecting plans for the initial unit of its new plant. The main works will be 105 x 386 ft., with adjoining structure, 60 x 100 ft., and power plant, 60 x 100 ft. It is estimated to cost $1,000,000, with equipment. George O. Rogers, Penn Building, is architect.

George H. Davy, 605 Fairview Avenue, Butler, Pa., and associates, have incorporated the Daubenspeck Chain Co., with capital stock of $50,000, to manufacture chains for industrial service.

The Harbison-Walker Refractories Co., Pittsburgh, has increased its capital stock from $27,600,000 to $36,000,000. P. R. Hilleman is secretary.

The North Pennsylvania Washer Co., Hatfield, Pa., is planning for the installation of new metal turning equipment and milling machines.

The Progress Watch & Clock Mfg. Co., Farrell, Pa., has changed its name to the Alexo Watch Co.

The Home Electric Appliance Co., Pittsburgh, manufacturer of electrical equipment, is planning for the erection of an addition. It recently increased its capital stock from $50,000 to $250,000.

The Pittsburgh Gage & Supply Co., Thirtieth and Liberty Streets, Pittsburgh, manufacturer of electrically operated washing machines, etc., has arranged for an increase in capital stock from $750,000 to $2,500,000.

Joseph Klein, 241 South Atlantic Avenue, Pittsburgh, and associates, have organized the Liberty Incandescent Supply Co., with capital stock of $30,000, to manufacture incandescent electric lamps and other specialties.

The American Steel Co., Park Building, Pittsburgh, has completed plans for a new one-story power plant at its Elwood City, Pa., works. B. B. Kelly is president.

The Shaffer Engineering & Equipment Co., Pittsburgh, is planning for enlargments in its plant. A capital stock issue to be used for this purpose has been sold to the Fawcus Machine Co.

The Whitemore Glass Co., Dunbar, W. Va., is planning the erection of a new machine shop and numerous additions in its general plant, including blow and tank departments to approximately double the present output. A. P. Whitemore is president.

The Chesapeake & Ohio Railroad, First National Bank Building, Richmond, Va., will build a new one-story machine and repair shop, 58 x 145 ft., at Raleigh, W. Va., and an engine house, 30 x 75 ft., estimated to cost $35,000.

Considerable machinery and operating equipment will be purchased by the National Shale Brick Co., Martinsburg, W. Va., recently organized to establish a local brick and burned clay products plant. About 50 acres has been acquired, and the works will cost about $250,000, including machinery. F. Vernon Aler is president and Charles L. McGee, secretary, both of Washington, D. C.

The Wheeling Steel & Iron Co., Wheeling, W. Va., has filed plans for extensions and improvements in its plant at Fifteenth and South Streets, to cost about $25,000.

The Baldwin Tool Works, Parkersburg, W. Va., is considering plans for an addition.

The Randall Coal Co., Morgantown, W. Va., is planning for the erection of a new tipple at its properties to cost about $45,000.

The Ohio Generator Co., Wheeling, W. Va., recently organized to manufacture acetylene gas generators and burning apparatus, has arranged for the establishment of its initial plant in the McMechen Building, Twenty-eighth Street. Offices have been opened at 1303 Main Street. E. M. Rodebaugh is head.

For the production of a double disk metal wheel, the Reliance Wheel Co., Youngstown, Ohio, is equipping a factory at 70-74 South Prospect Street, and expects to begin operations at an early date.

The Akron-Newton Furnace & Machine Co., commenced operations this week in the plant of the Frank B. Hall Mfg. Co., Newton Falls, Ohio. It will make band saws. Thomas Stevens, maintenance mechanic for the Trumbull lamp division of the General Electric Co., Warren, Ohio, has been made superintendent of the machine shop.

Cincinnati

CINCINNATI, June 21.

Dullness continues in the machine tool market and no large lists are out. Some orders, however, are being received for single machines. The report in these columns last week that the Chesapeake & Ohio Railroad had purchased the tools on its list recently issued, was a little premature, as only a small portion of this order has been placed. Some manufacturers have received a number of cancellations, but this is due to deliveries on these tools being very indefinite. Smaller shops making tools, jigs, dies, etc., are busy and several have received good sized orders the past week from automobile manufacturers.

The crane market is very active and the J. K. Nickerson Co. during the week booked orders from the Cincinnati Iron & Steel Co. for a 5-ton Shepard under-hung electric crane with 24-ft. span, and a 5-ton Shepard electric crane with a 30-ft. span from the Ohio Falls Iron Co., New Albany, Ind.

The Pioneer Auto Heater Co., Cincinnati, will be incorporated in the next few days and after securing a plant will begin manufacturing an exhaust heater for motor cars. T. J. Scott of the Scott-Spencer Automatic Tool Co. heads the new company.

The Capital Lift & Mfg. Co., Columbus, Ohio, has been incorporated with a capital of $25,000 by F. M. Taylor, W. H. Ednister, J. C. Naylor, H. Franz and M. Brady. It is understood the company will manufacture elevators.

The Westinghouse Electric & Mfg. Co., Cincinnati, has taken a 10-year lease of four floors in the building being constructed by the Ferro-Concrete Constructing Co., Third and Elm streets, providing about 50,000 sq. ft. of floor space.

The Dayton Pump & Mfg. Co., Dayton, Ohio, has increased its capitalization from $1,000,000 to $1,300,000.

Joseph Westendorf has purchased the stock of Clyde Miner, former president Lucas-Miner Tool & Production Co., Dayton, Ohio, and at a meeting of the board of directors was elected president of the company. Mr. Milner, it is understood, will be connected with the General Electric Co., Schenectady, N. Y.

Construction on the new foundry of the Midwest Castings Co., Middletown, Ohio, is practically completed and it is expected that the first heat will be poured the last of the month. The company has a large number of orders and when operations are started 125 men will be employed. M. G. Wittlinger is general manager.

The Union Motor Corporation, Eaton, Ohio, recently organized and now erecting a factory, has changed its name to the Washington Motor Corporation.

The Western Foundry & Mfg. Co., Sigler Street, Springfield, Ohio, has increased its capitalization from $10,000 to $35,000. It is understood that extensions are contemplated. John E. Howell is president.

The Parker Pattern Works, Springfield, Ohio, has been incorporated with a capitalization of $25,000. The purpose of the incorporation is to enable it to make some necessary improvements in the property. W. T. Parker heads the company.

The Pioneer Auto Heater Co., Cincinnati, has been organized by Tom J. Scott, president Scott-Spencer Automatic Tool Co., to manufacture a patented automobile exhaust heater. Operations will begin in 30 days.

The American Can Co., New York, has awarded contract

to the Ferro-Concrete Construction Co. for the erection of its new plant at Cincinnati to cost, with equipment, about $1,000,000. Plans call for the erection of a main six-story building, 72 x 260 ft., and one four stories, 64 x 140 ft., both of concrete. Two one-story steel and brick structures, 90 x 97 ft. and 80 x 160 ft., will also be built. It is understood that Cincinnati will become the distributing point for the company's products throughout the Middle West.

The Ideal Pattern Works, Murray Road, St. Bernard, Ohio, has had plans prepared for a two-story and basement factory, 48 x 75 ft., to cost about $15,000.

The National Tire & Rubber Co., East Palestine, Ohio, has arranged for a preferred stock issue totaling $500,000 the proceeds to be used for enlargements and new machinery. S. L. Warner is vice-president and W. A. Metzler, superintendent.

The Air Friction Carburetor Co., First and Madison streets, Dayton, Ohio, is arranging plans for its two-story addition, 50 x 150 ft., estimated to cost $40,000.

The Follansbee Brothers Co., Pittsburgh, will build a new power plant at its works at Toronto, Ohio.

The King Machine Tool Co., Clifton Avenue, Cincinnati, has awarded contract to the H. C. Hazen Contracting Co., 2070 Reading Road, for a one-story brick and steel machine shop to cost about $70,000.

The Lunkenheimer Co., Beekman Street, Cincinnati, manufacturer of valves, steam specialties, etc., has awarded a contract to the Fisher-Devore Construction Co., 36 Blymer Building, for the erection of the proposed one-story addition to its plant, 350 x 400 ft., to cost about $400,000.

Indianapolis

INDIANAPOLIS, June 21.

The plant of the American Seeding Co., Richmond, Ind., has been sold to the International Harvester Co. of America. Willard Z. Carr, vice-president, and Burton Carr, another official, will retain their positions under the new owners. About 800 men are employed at the Richmond plant which, it is said, will be enlarged. The American Seeding Co. has another plant at Springfield, Ohio.

The Bedford Steel & Construction Co., Bedford, Ind., has been incorporated with $10,000 capital stock. The directors are George A. Haynes, Jay Garriott and William E. Arthur.

The Cummings Voting Machine Co., Winamac, Ind., has bought the wheel plant at Knox, Ind., which it will use to manufacture its product.

The Columbia Safety Appliance Co., Columbia City, Ind., incorporated with $100,000 capital stock, will manufacture a non-explosive gasoline can. The tops and safety appliance will be placed on the cans by acetylene welding machines. Jay Stuckman is president and Ernest Cotterly, secretary.

The Gladiator Mfg. Co. has been incorporated at Auburn, Ind., with $150,000 capital stock, to manufacture automobiles. The directors are James D. Casey, Harry C. McIntyre and J. R. Casey.

The Ainsworth Fan Corporation, Indianapolis, has been incorporated with $50,000 capital stock to manufacture fan-supporting devices. The directors are Mark Ainsworth, Arthur W. and L. Wood.

The Steel Fabricating Corporation, Indianapolis, has been incorporated with $3,000,000 capital stock. The directors are C. R. Trowbridge, O. L. Towell and Lloyd O'Brien. The company has been reorganized and the capital stock increased from $800,000 for the purpose of erecting a third plant. It has works at Harvey, Ill., and East Chicago, Ind., and manufactures sectional steel buildings.

The Gogebic Steel Co., Crown Point, Ind., has filed articles of dissolution.

The Delaware Aluminum Co., Twentieth and South Walnut streets, Muncie, Ind., has commenced the erection of a one-story machine shop and foundry to cost about $20,000.

The Central South

ST. LOUIS, June 21.

The P. Bannon Pipe Co., Louisville, has awarded contract to the General Contracting Co., 231 Fifth Street, for a two-story and basement addition, 71 x 106 ft., to cost about $70,000.

The Dixie Rubber Co., 770 Randolph Building, Memphis, Tenn., will soon call for bids for the erection of its proposed new works with main structure, 80 x 300 ft. It is planned to develop a capacity of 500 automobile tires per day. A power house will also be constructed. The new plant is estimated to cost about $175,000.

The Eclipse Mfg. Co., Hope, Ark., manufacturer of structural steel specialties, has increased its capital stock to $100,000.

The Turnbull Cone Machine Co., Chattanooga, Tenn., has been incorporated with a capital stock of $200,000 by W. W. Turnbull, J. F. Fimley and W. M. Seratt, to manufacture special machinery and parts.

The City Council, Claremore, Okla., is planning for the erection of an addition to the municipal electric power plant, to include the installation of new generator, exciter, engines, boilers, pumps, condenser and other apparatus.

The Blanton Mfg. Co., Second and Spruce streets, St. Louis, will equip a power plant in connection with its new addition to cost about $225,000. The installation will comprise four 350-hp. boilers, electric generators, coal and ash handling machinery, refrigerating equipment and other apparatus. David A. Blanton is president.

The Gravois Foundry & Mfg. Co., manufacturer of grey iron castings, St. Louis, started operations again June 15. Its main buildings were destroyed by fire April 30, but have been entirely reconstructed and new equipment installed. Its daily output will be 15 tons.

The Gulf States

BIRMINGHAM, June 21.

The Imperial Soil Pipe Works, Bessemer, Ala., is planning for the erection of a new unit for the manufacture of iron pipe and fittings. It is proposed to develop a capacity of about 30 tons a day.

The Rex Motor Car Mfg. Co., New Orleans, La., is contemplating the erection of a new plant in this section. The present works are in leased quarters and it is proposed to build for a much larger output. It recently increased its capital stock from $250,000 to $1,000,000.

The Wharton Motors Co., 914 Main Street, Dallas, Tex., is having plans prepared for its proposed new works on property recently acquired at Mockingbird Lane and Airline Road. The initial building will be four stories, 80 x 380 ft. It will be equipped for the manufacture of automobiles, trucks and tractors and is estimated to cost about $300,000, of which $100,000 will be used for machinery. In the near future it is planned to build additions. Thomas P. Wharton is president. H. A. Overbeck is the architect.

The Alabama Silica Products Co., Trussville, Ala., will install new stone grinding machinery, conveyors, loading apparatus, etc., in connection with extensions to its recently acquired works in this section. E. D. Jordan is president and manager.

The Eastland Hardware Co., Eastland, Tex., has been incorporated with a capital stock of $120,000 by Joseph Burkett and Thomas Harrell, to manufacture hardware specialties.

The Claypool Machine Co., 1711 Calhoun Street, Fort Worth, Tex., has acquired about four acres and contemplates the erection of an addition to its plant.

The Martin Wagon Co., Lufkin, Tex., manufacturer of wagons and parts, is planning for the erection of two additions. It recently increased its capital stock from $75,000 to $125,000. W. L. Ziegler is general manager.

The Center Handle Factory, Inc., Center, Tex., recently incorporated, is contemplating the establishment of a plant 40 x 80 ft., in the vicinity of Cherino for the manufacture of handles, tools, etc. W. H. Liem is president and manager.

The Phoenix Clay Corporation, Dallas, Tex., recently organized with a capital stock of $200,000, is arranging for the erection of a new plant in the vicinity of Bridgeport, Tex., for the manufacture of brick and tile. The machinery installation will provide a daily capacity of 125,000 brick and 150 tons of tile. C. W. Martin, Dallas, is president and J. V. Montrief, Bridgeport, is superintendent.

The Standard Battery Mfg. Co., Fort Worth, Tex., is planning for the enlargement of its works, with the installation of considerable new machinery. It recently filed articles of incorporation with a capital stock of $75,000. Albert Kramer is president.

Plans for the establishment of works are being made by the Vulcan Welding & Machine Co., Miami, Fla. Prices are wanted on steam hammers, lathes, gear shapers, boiler plate and tank steel and electric welding equipment. A. DeBogery, 1214 Tenth Street, is manager.

The Limbaugh Machine Co., Jacksonville, Fla., recently incorporated with $20,000 capital stock, will build a machine shop, 30 x 70 ft. R. W. Limbaugh is manager.

The Pacific Coast

SAN FRANCISCO, June 15.

Machinery sales in this section have taken a decided slump. There seems to be ample inquiry and in most cases prospective buyers are demanding the standard makes, but when confronted by a six months' or longer term of shipment they refuse to place orders. While an actual letting up of business or a serious falling off is not looked for, a real recovery is not anticipated until next fall.

Farming machinery has been active in the Seattle district with increasing interest in gasoline-propelled equipment. Secondhand tools are in great demand.

Procter & Gamble, Cincinnati, have bought 56 acres in Richmond, Cal., and will build a plant at a cost of $2,000,000 for the manufacture of food products and soap. A copra crushing mill, with a daily capacity of 100 tons, will also be erected.

The Great Western Smelting & Refining Co., San Francisco, has bought the southeast corner of Spear and Folsom streets, 137 x 137 ft., and adjoining property of the same size, with the intention of making improvements in the near future.

The Pacific Steel Products Co., 211 West Sixteenth Street, Los Angeles, has been organized to manufacture iron and steel specialties. J. W. and G. A. Van Dorn, 2221 West Twenty-first Street, head the company.

The White Aircraft Corporation, Los Angeles, has been incorporated with a capital stock of $50,000 by George D. White, 3832 South Main Street, Arlyn T. Vance and Henry R. Davis, to manufacture aeroplanes and parts.

The Great Western Motors Co., Inc., 151-155 Twelfth Street, Oakland, Cal., will establish new works at 561 Fourth Street, for general truck repairs, parts manufacture and body production. Paul E. Morse is president and general manager.

The Continental Auto Radiator Mfg. Co., Los Angeles, has filed notice of organization to manufacture automobile radiators and other sheet metal products. J. H. Briskin, 1385 East Twenty-second Street, heads the company.

The Coast Tire & Rubber Co., Oakland, Cal., is arranging for the immediate erection of a new plant on East Twelfth Street, between Forty-eighth and Fiftieth Streets. It is proposed to have the structure complete and ready for operation early in September. E. Lawhorn is general superintendent.

The Fabricord Tire Co. of California, Los Angeles, has been incorporated with a capital stock of $2,000,000 by S. H. Christian, M. E. Burns and J. Ross Moore. About 30 acres in the vicinity of San Pedro have been acquired, and plans are under way for the initial units of the new works which are estimated to cost $460,000, $200,000 to be expended for machinery. The output for the first unit will be about 500 tires and 1500 inner tubes per day, which will be increased gradually. Mr. Christian founded the Perfection Tire Co., Chicago, and will act as president of the new organization.

Konrad Gobel, Inc., Webster Street, Oakland, Cal., manufacturer of automobile bodies and tops, etc., is planning for the erection of an addition.

The Jumbo Truck Co., 1416 South Los Angeles Street, Los Angeles, has filed notice of organization to manufacture motor truck parts and equipment. William P. Bideiman, 627 North Manhattan Street, heads the company.

The Pacific Gas Radiator Co., 614 South Grand Avenue, Los Angeles, manufacturer of gas radiators, has filed plans for a one-story brick addition, 50 x 127 ft.

Milwaukee

MILWAUKEE, June 21.

Expansion of the Horizontal Hydraulic Hoist Co., Milwaukee, will follow the transfer of controlling stock in the company to G. A. Wood, Detroit. Plans provide for the installation of new machinery and enlarging the facilities to double the present capacity. The plant will be in charge of Logan Wood, Chicago, the new vice-president, who will move to Milwaukee

The Production Machine Tool Corporation, Milwaukee, has been organized by Charles Gordon, Bessie Toorney and George E. Ballhorn, with a capital stock of $250,000. It will manufacture machinery appliances, etc.

The Aluminum Goods Mfg. Co., which operate five plants with the largest factory and general offices at Manitowoc, Wis., has increased its capital stock from $8,000,000 to $12,000,000, consisting of $8,000,000 common and $4,000,000 preferred stock.

The American Valve Rotator Co., Milwaukee, has filed articles of incorporation and will engage in the manufacture of metal products. It has a capital stock of $100,000. Henry Danischefsky, J. A. Dietrich and Howard Foulkes are the incorporators.

Expansion of the Continental Axle Co., Edgerton, Wis., is anticipated with the increasing of the capital stock from $200,000 to $500,000. The officers are Andrew McIntosh, president, and E. Z. Menhall, secretary.

The Samson Tractor Co., subsidiary of the General Motor Corporation has leased the plant of the Waukesha Malleable Iron Works, Waukesha, Wis., for five years. It will be put on Samson work exclusively. Construction of the new foundry at Janesville will be continued, and is expected to be ready for operation in July. Two machine construction units of the Samson plant are to be extended 150 ft., adding 25 per cent to the present floor space.

The Jorgensen Mfg. Co., producing automotive equipment, Waupaca, Wis., has started the construction of its new building program, the first unit to be 60 x 150 ft. The company has orders booked for the next eight months.

Plans are being completed for the erection of a garage and machine shop for William Christel, Valders, Wis., by Juul & Smith, architects, Manitowoc, Wis. It will be 60 x 100 ft. one and two-stories.

The Holt Lumber Co., Oconto, Wis., has plans under way for the construction of a 1000-hp. plant, 40 x 50 ft., to cost $75,000. C. M. Garland, 38 South Dearborn Street, Chicago, is consulting engineer.

Canada

TORONTO, June 21.

Bruce Stewart & Co., Charlottetown, P. E. I., manufacturers of gasoline engines, have started work on the erection of a new building, 60 x 120 ft., of brick and concrete, which when completed, will double the capacity of the plant. In addition to manufacturing gasoline engines, a general machine shop and foundry business will be conducted.

The Bird Archer Co., New York, recently incorporated, has taken over the ammunition plant at Cobourg, Ont., formerly operated by the Cohoes Steel Co., and is transferring its boiler chemical department to the new plant. It also proposes to add the manufacture of high-speed cast-steel tools and foundry chemicals. About 75 men will be employed.

The Eternal Battery Co., of Canada, Ltd., recently organized to take over the business of the Eternal Battery Co., Winnipeg, Man., has acquired a 2-acre site at the corner of Main Street and Toronto Avenue, Kildonan, on which it will erect a plant. Charles W. Jenner is president, and associated with him are Don I. Cameron, R. W. Paterson, T. L. Harley, C. T. Lount and Elmar E. Soot.

Traction Rims, Ltd., Toronto, has been incorporated with a capital stock of $50,000, by Raymond L. Hughes, 84 Bedford Road; James Stewart, Hamilton J. Stuart and others, to manufacture automobile rims, wheels, machinery, tools, etc.

The Lightning Change Rim, Ltd., Toronto, has been incorporated with a capital stock of $300,000, by Frank J. Hughes, 110 Roxborough Street West; Leo. J. Phelan, 72 Queen Street West; Daniel P. J. Kelly and others to manufacture automobiles, accessories, tools, etc.

Motor Depot, Ltd., Toronto, has been incorporated with a capital stock of $100,000, by Russell P. Locke, 120 Bay Street; Howard A. Hall, 36 Ellsworth Avenue; Arthur W. McNally and others, to manufacture boats, engines, motors, accessories, etc.

C. W. Ripley, 519 Sandwich Street, Sandwich, Ont., is making preparations and will start work at an early date on the erection of a foundry at Windsor, Ont., to cost $25,000.

The Firestone Tire & Rubber Co., Sherman Avenue, Hamilton, Ont., has let the general contract to the Piggott & Healey Construction Co., 36 James Street South, for a factory to cost $500,000.

The Record Foundry & Machine Co., Luts Street, Moncton, N. B., has let the general contract to Ambrose Wheeler, 13 Railway Avenue, for a foundry to cost $50,000.

Hiram Walker Sons, Ltd., Walkerville, Ont., has let the general contract to R. Westcott & Co., Sheppard Street, Windsor, Ont., for the erection of a power plant, to cost $175,000.

The sawmill at Yelverton, near Lindsay, Ont., owned by Thomas Brisbane, was destroyed by fire June 18, with a loss to building and machinery of about $30,000.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron, base price	5.25c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 5.25c.
1 to 6 in. x ⅜ to 1 in.	3.52c. to 5.25c.
1 to 6 in. x ¼ to 5/16	3.62c. to 5.25c.
Rods—⅝ and 11/16	3.57c. to 5.05c.
Bands—1½ to 6 by 3/16 to No. 8	4.22c. to 6.50c.
Hoops	5.57c. to 6.57c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c. to 5.25c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 5.25c.
3 in. x 3/16 in. and ⅛ in.	3.72c. to 5.60c.
1½ to 2½ in. x ⅛ in.	3.52c. to 5.90c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 5.85c.
1 to 1¼ in. x 3/16 in.	3.52c. to 5.90c.
1 to 1¼ x ⅛ in.	3.57c. to 5.95c.
⅞ x ⅞ x ⅛ in.	3.62c. to 6.00c.
¾ x ⅛ in.	3.67c. to 6.05c.
⅝ x ⅛ in.	4.07c. to 6.85c.
½ x 3/32 in.	5.17c. to 7.55c.
Tees:	
1 x ⅛ in.	3.87c. to 6.25c.
1¼ in. x 1¼ x 3/16 in.	3.77c. to 6.15c.
1½ to 2½ x 3/16 in. and thicker	3.57c. to 5.95c.
3 in. and larger	3.52c. to 5.30c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	5.00c. to 5.25c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	5.50c.
Toe calk ½ x ⅜ in. and larger	6.00c.
Cold-rolled strip (soft and quarter hard)	12c. to 14c.
Open-hearth spring steel	7.00c. to 10.00c.
Shafting and Screw Stock:	
Rounds	6.25c. to 7.00c.
Squares, flats and hex	6.75c. to 7.50c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c. to 24.00c.
Extra best cast steel	25.00c. to 30.00c.

Tank Plates—Steel

	Per Lb.
¼ in. and heavier	3.67c. to 5.50c.

Sheets

Blue Annealed

	Per Lb.
No. 10	7.12c. to 8.30c.
No. 12	7.15c. to 8.35c.
No. 14	7.22c. to 8.40c.
No. 16	7.32c. to 8.50c.

Box Annealed—Black

	Soft Steel C.R., One Pass per lb.	Wood's Refined, per lb.
Nos. 18 to 20	8.30c. to 9.90c.	
Nos. 22 and 24	8.35c. to 9.85c.	10.80c.
No. 26	8.40c. to 9.90c.	10.85c.
No. 28	8.50c. to 10.00c.	11.00c.
No. 30	8.60c. to 10.10c.	

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	8.75c. to 10.50c.
No. 16	9.00c. to 10.75c.
Nos. 18 and 20	9.15c. to 10.90c.
Nos. 22 and 24	9.30c. to 11.05c.
No. 26	9.45c. to 11.20c.
No. 27	9.60c. to 11.35c.
No. 28	9.75c. to 11.50c.
No. 30	10.25c. to 12.00c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
½ in. Butt...	—36	—19	¾-1½ in. Butt.	— 5	+15
¾-3 in. Butt.	—40	—24	2 in. Lap....	+ 1	+19
3½-6 in. Lap..	—35	—20	2½-6 in. Lap.	— 1	+15
7-12 in. Lap.	—25	— 8	7-12 in. Lap..	+10	+28

Steel Wire

Base Price* on No. 9 Gage and Coarser	Per lb.
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	28¼c. to 29½c.
High Brass Wire	28¼c. to 29½c.
Brass Rod	26¾c. to 29 c.
Brass Tube	42½c. to 44½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb...	11.80	11.55
		90 lb...	11.90	11.65
		100 lb...	12.00	11.75
IC...$16.50	$14.25	IC...	12.25	12.00
IX... 18.75	16.25	IX...	13.25	13.00
IXX... 20.50	18.00	IXX...	14.25	14.00
IXXX... 22.25	19.75	IXXX...	15.25	15.00
IXXXX... 23.75	21.50	IXXXX...	16.25	16.00

Terne Plates

8 lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	53c.
Bar	58c. to 60c.

Copper

Lake ingot	20c.
Electrolytic	19½c.
Casting	19¼c.

Spelter and Sheet Zinc

Western spelter	10c. to 11c.
Sheet zinc, No. 9 base, casks	14½c. open 15c.

Lead and Solder*

American pig lead	10c. to 11c.
Bar lead	11c. to 12c.
Solder ½ and ½ guaranteed	38c.
No. 1 solder	35c.
Refined solder	31c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	11¼c. to 11¾c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	35c. to 38c.

Old Metals

The market is still discouraged and prices a little lower in most items. Dealers' buying prices are as follows:

	Cents per lb.
Copper, heavy and crucible	16.00
Copper, heavy and wire	15.00
Copper, light and bottoms	13.00
Brass, heavy	10.00
Brass, light	7.25
Heavy machine composition	15.25
No. 1 yellow brass turnings	9.50
No. 1 red brass or composition turnings	12.25
Lead, heavy	7.00
Lead, tea	5.00
Zinc	5.25